SERVICE MANUAL

SANYO

COLOUR VIDEO
CASSETTE RECORDER

VHS
PAL

Models
VHR-1110
VHR-2100
VHR-2300
VHR-2500
VHR-2700

Series and

VHR-1700M
VHR-2350EE

MECHANISM DESCRIPTION AND MECHANISM ADJUSTMENT

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Reference No. WM-18674

1. MECHANISM DESCRIPTION

1-1. MAIN MECHANISM COMPONENTS AND LAYOUT DIAGRAM (Figs. 1-1-1 and 1-1-2)

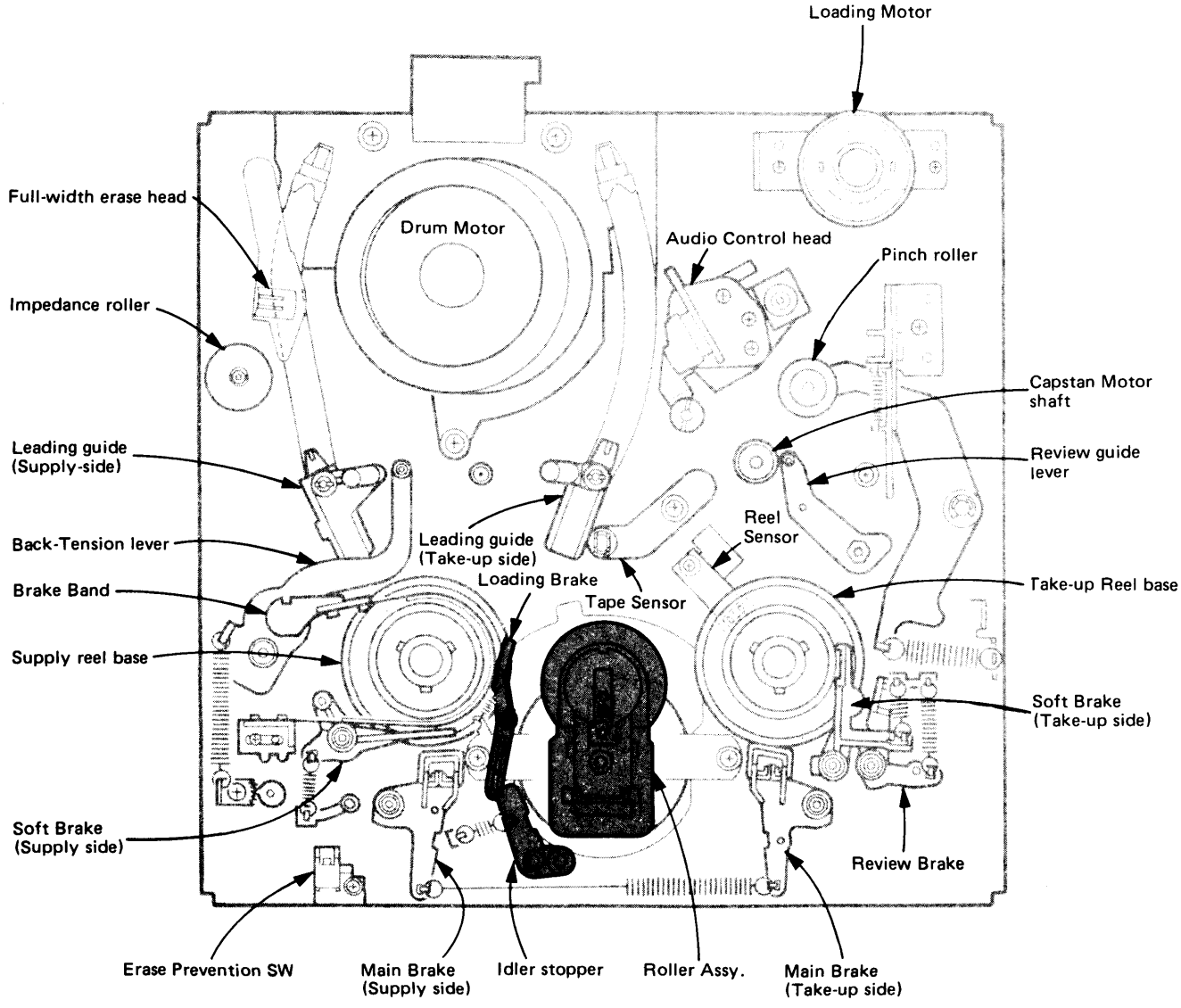


Fig. 1-1-1 Mechanism Assembly Top View

■ main changed parts compared to former models VHR-1100, VHR-1300 and VHR-1500.

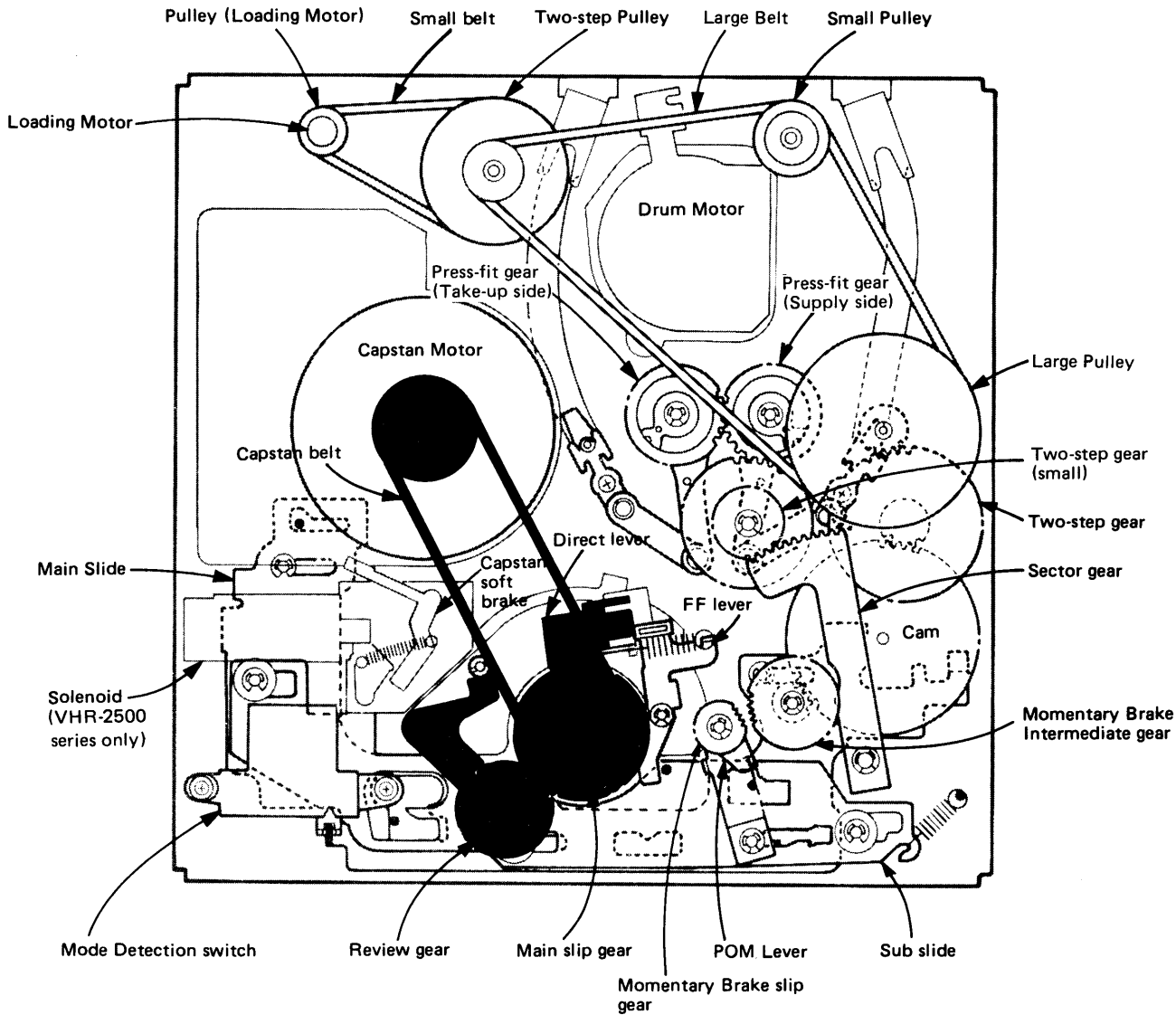


Fig. 1-1-2 Mechanism Assembly Bottom View

1-2. OUTLINE OF MECHANISM OPERATION

The greatest change compared to former models (VHR-1100, VHR-1300 and VHR-1500 series) is the change of rotation of both reel bases from the reel motor to the capstan motor.
well as the movement of both guides, the transition device to each mode, and the safety device, are fundamentally the same as for previous models (VHR-1100, VHR-1300 and VHR-1500 series), so their description is omitted here.

1-3. DIFFERENCES FROM PREVIOUS MODELS (VHR-1100, VHR-1300 and VHR-1500 series)

There are five points which are different, regarding the mechanism's main components, between this mechanism and that of former models.
The operation of those components is described below.

1-3-1. Method of drive transmission of both reel bases

By using this mechanism, the reel motor is eliminated, and the rotation of the capstan is transmitted via the belt to the main slip gear; the direction of reel base rotation depends upon the direction of rotation of the capstan.
As a result, it can be seen that the function of the newly added main slip gear is very important.
Figure 1-3-1 shows the rotation-transmission system.

*Main slip gear:
The slip mechanism functions during the PLAY, REC, F/R-SEARCH and SLOW modes.
In other words, because force is transmitted from the pulley gear to the drive gear via the felt for slippage during these modes, the rpm of the drive gear is caused to be reduced to less than the rpm of the pulley gear. The pulley gear and the drive gear are locked during the F-FWD and REW modes, with the result that the rotation of the pulley gear and of the drive gear is the same rotation.

*Review gear:
The review gear is engaged with the main slip gear during the R-SEARCH mode.

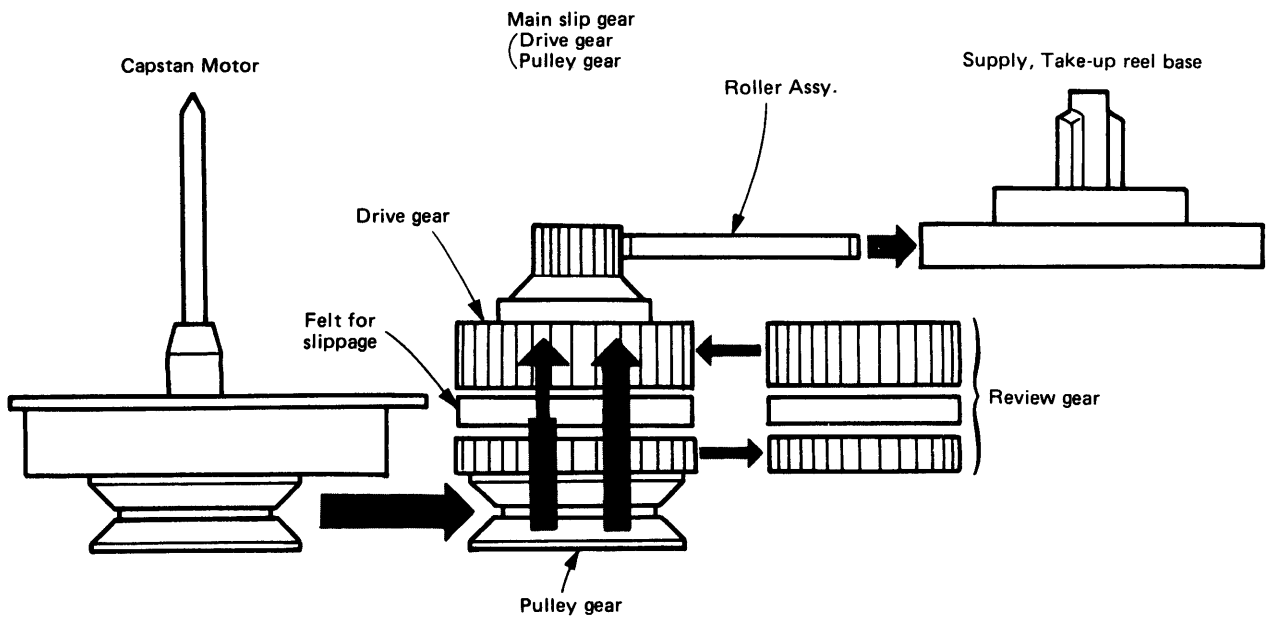


Fig. 1-3-1

1-3-2. Main slip gear (Fig. 1-3-2(a) and Fig. 1-3-2(b))

The main slip gear is composed of the pulley gear and the drive gear. A slip mechanism made of felt is incorporated at the drive gear side.

Figure 1-3-2(a) shows the ordinary conditions (PLAY, REC, F/R-SEARCH, UNLOADING, SLOW, etc.).

When the capstan motor rotates during these conditions, the pulley gear is caused to be driven, and thus the drive gear is caused to be driven via the slip mechanism.

Figure 1-3-2(b) shows the fast forward and rewind conditions.

The FF lever is caused to move in the ➔ direction by the sub slide being activated in the loading direction by the movement of the cam.

As a result of this action, the spring coil located between the FF lever and the direct lever is caused to be pulled, with the result that the lock ring is caused to be activated in the lifting direction.

As a result, the pulley gear and the drive gear are caused to be locked, and, when the capstan motor rotates, the pulley gear and drive gear rotate as a unified component, with the result that there is no slippage.

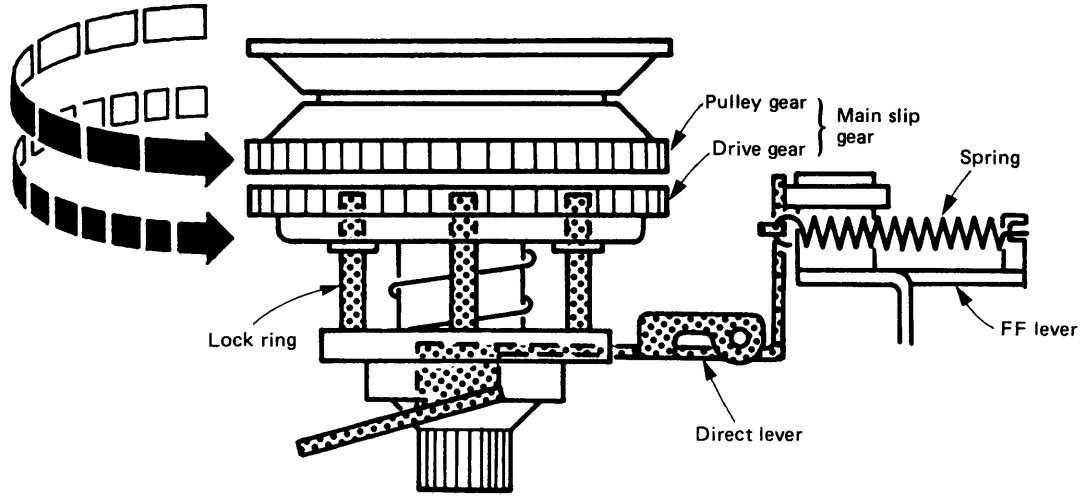


Fig. 1-3-2(a) Slip condition

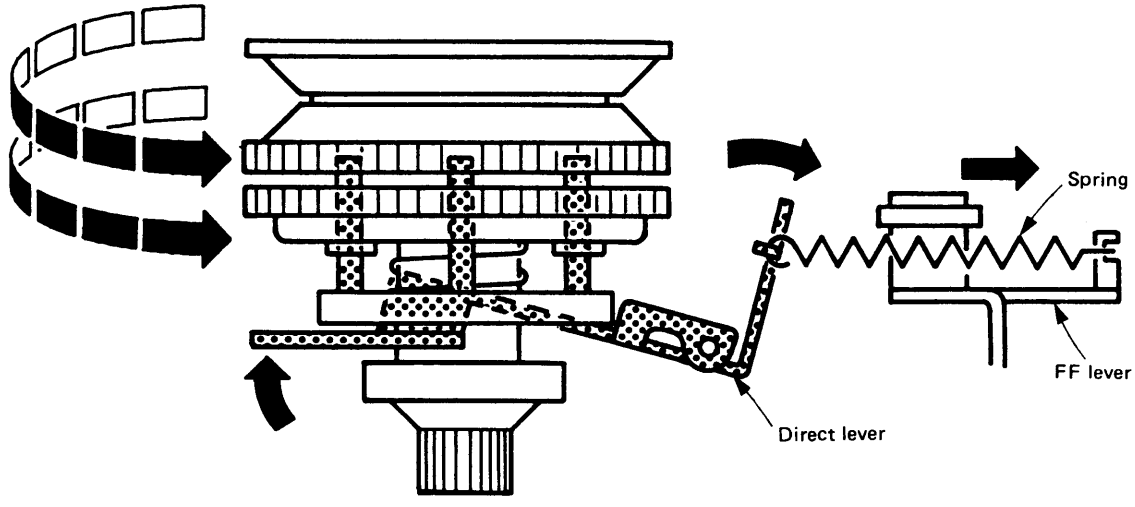


Fig. 1-3-2(b) Lock condition

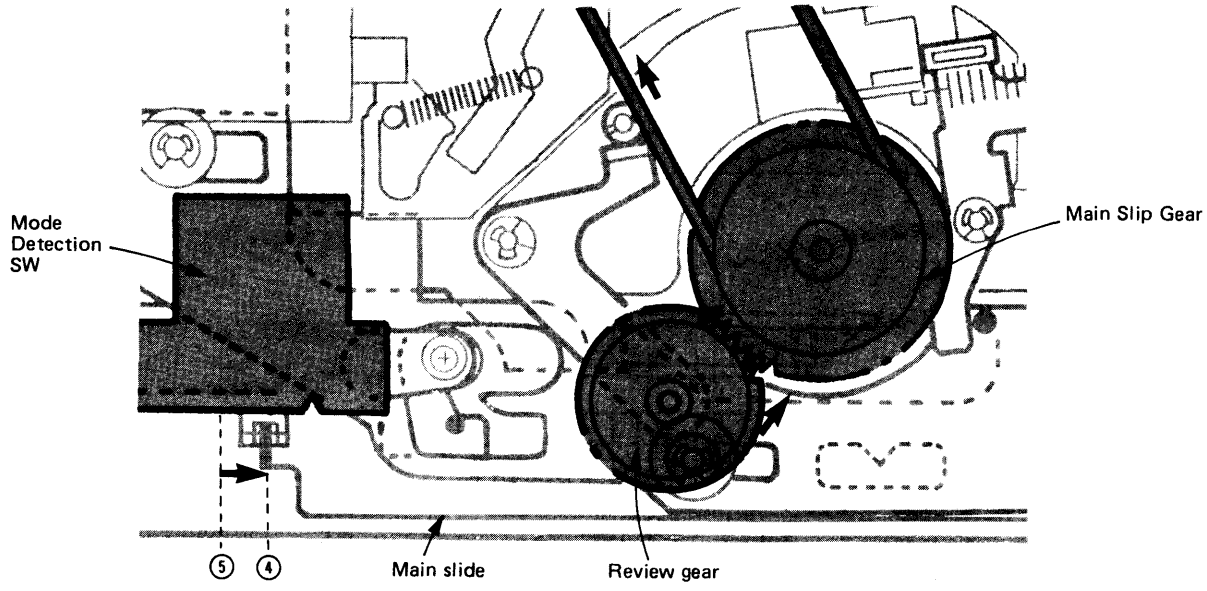
1-3-3. Review gear

This gear functions during the R-SEARCH mode.

Because tape take-up during the R-SEARCH mode is via the drum, a stronger rotation (than for the F-SEARCH mode) is necessary.

(The rotation torque during the F-SEARCH mode is 70 ±15g-cm, and during the R-SEARCH mode is 200 ±30g-cm.)

For this reason, the review gear is used to increase the rotation torque of the main slip gear (pulley gear and drive gear).



Moving the main slide from PLAY mode ⑤ to R-SEARCH mode ④.

Fig. 1-3-3

1-3-4. Capstan "soft" braking by solenoid (Fig. 1-3-4 VHR-2500 series only)

The "soft" braking is switched ON during the SLOW mode and the STILL mode.

The capstan motor operates under intermittent drive conditions during the SLOW mode and the STILL mode. In order to stabilized the intermittent drive of the capstan motor, a solenoid is used to apply braking to the capstan motor.

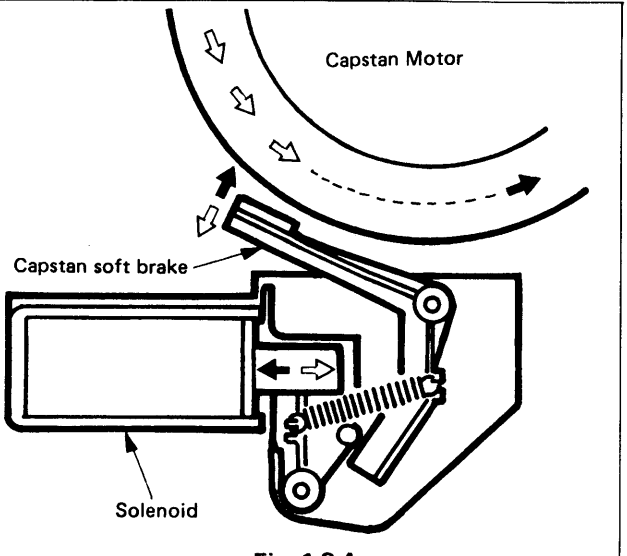


Fig. 1-3-4

The voltage applied from the system-control circuitry to both terminals of the solenoid during the SLOW mode and the STILL mode is 13V.

1-3-5. Loading brake (Fig. 1-3-5)

In order to eliminate tape loosening or slack during the loading operation, braking is applied to the supply reel base side during loading.

When the loading operation is finished, the loading brake is released.

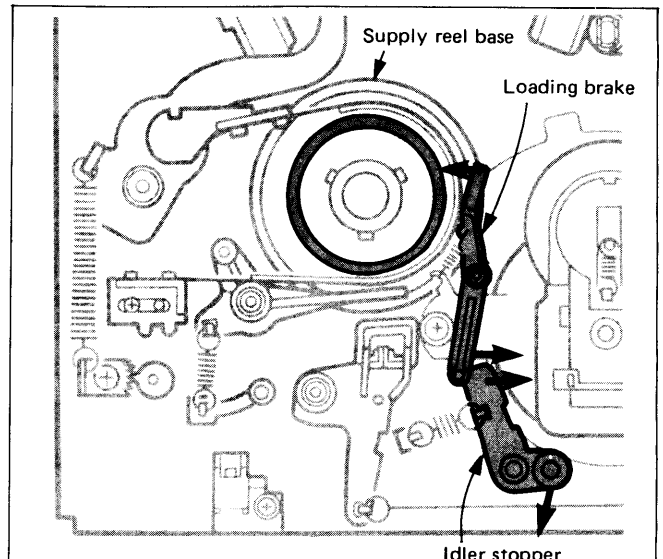


Fig. 1-3-5

1-4. MECHANISM OPERATION IN EACH MODE (Table 1-4-1)

Parts Name / Mode	Front Loading Motor	Loading Motor	Capstan Motor	Drum Motor	Main Brake		Soft Brake		Review Brake	Loading Brake (Supply Reel Base)	Mode Detection SW Position
					Supply side	Take-up side	Supply side	Take-up side			
Cassette IN	ON (CCW)	OFF	ON→OFF (CCW)	OFF	OFF	ON	ON	ON	OFF	OFF	①
STOP	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	OFF	OFF	①
Loading	OFF	ON (CCW)	ON→OFF (CCW)	ON (CCW)	OFF	ON	ON	ON	ON	ON	②→③
Un-Loading	OFF	ON (CW)	ON (CCW→CW→CCW)	ON (CCW→OFF)	OFF	ON	ON	ON	ON	ON	③→②
PLAY/REC	OFF	OFF	ON (CW)	ON (CCW)	OFF	OFF	OFF	ON	OFF	OFF	⑤
F-SEARCH	OFF	OFF	ON (CW)	ON (CCW)	OFF	OFF	OFF	ON	OFF	OFF	⑤
R-SEARCH	OFF	OFF	ON (CCW)	ON (CCW)	OFF	OFF	ON	ON	ON	OFF	④
REVERS PLAY x2	OFF	OFF	ON (CCW)	ON (CCW)	OFF	OFF	ON	ON	ON	OFF	④
STILL	OFF	OFF	OFF	ON (CCW)	OFF	OFF	OFF	ON	OFF	OFF	⑤
SLOW (VHR-2500 series only)	OFF	OFF	ON (CW)	ON (CCW)	OFF	OFF	OFF	ON	OFF	OFF	⑤
F-FWD	OFF	OFF	ON (CW)	ON (CCW)	OFF	OFF	ON	ON	OFF	OFF	②
REW	OFF	OFF	ON (CCW)	ON (CCW)	OFF	OFF	ON	ON	OFF	OFF	②
PAUSE	OFF	OFF	ON→OFF (CW→CCW)	ON (CCW)	OFF	OFF	ON	ON	ON	OFF	③
EJECT	ON (CW)	OFF	ON→OFF (CCW)	OFF	OFF	ON	ON	ON	OFF	OFF	①

Notes:
1. CW: clockwise
   CCW: counterclockwise
   The rotation of the front-loading, reel, capstan and drum motors is as seen from the chassis top, and the rotation of the loading motor is a seen from the bottom of the chassis.
2. ON/OFF of brakes:
   ON: Brake is applied to reel base.
   OFF: Brake is not applied to reel base.

Table 1-4-1

1-5. OPERATION IN EACH MODE

For this model, both reel bases are rotated according to the drive by the capstan motor.
As a result, the method employed for transmission of the rotation of both reel bases has been changed from the reel motor used for previous models (VHR-1100, VHR-1300 and VHR-1500 series) to the capstan motor.
Even though the operation for each mode has changed from the reel motor to the capstan motor, the movement of the mechanism is fundamentally the same as for previous models.

The movement of the motor and brakes during the following four operations is described by timing chart, and the explanation is omitted here.
(1) From STOP mode to PLAY mode
(2) From PLAY mode to R-SEARCH mode
(3) From REC mode to REC PAUSE mode
(4) From STOP mode to F-FWD (REW) mode
(5) From PLAY mode to STOP mode

1-5-1. From STOP mode to PLAY mode

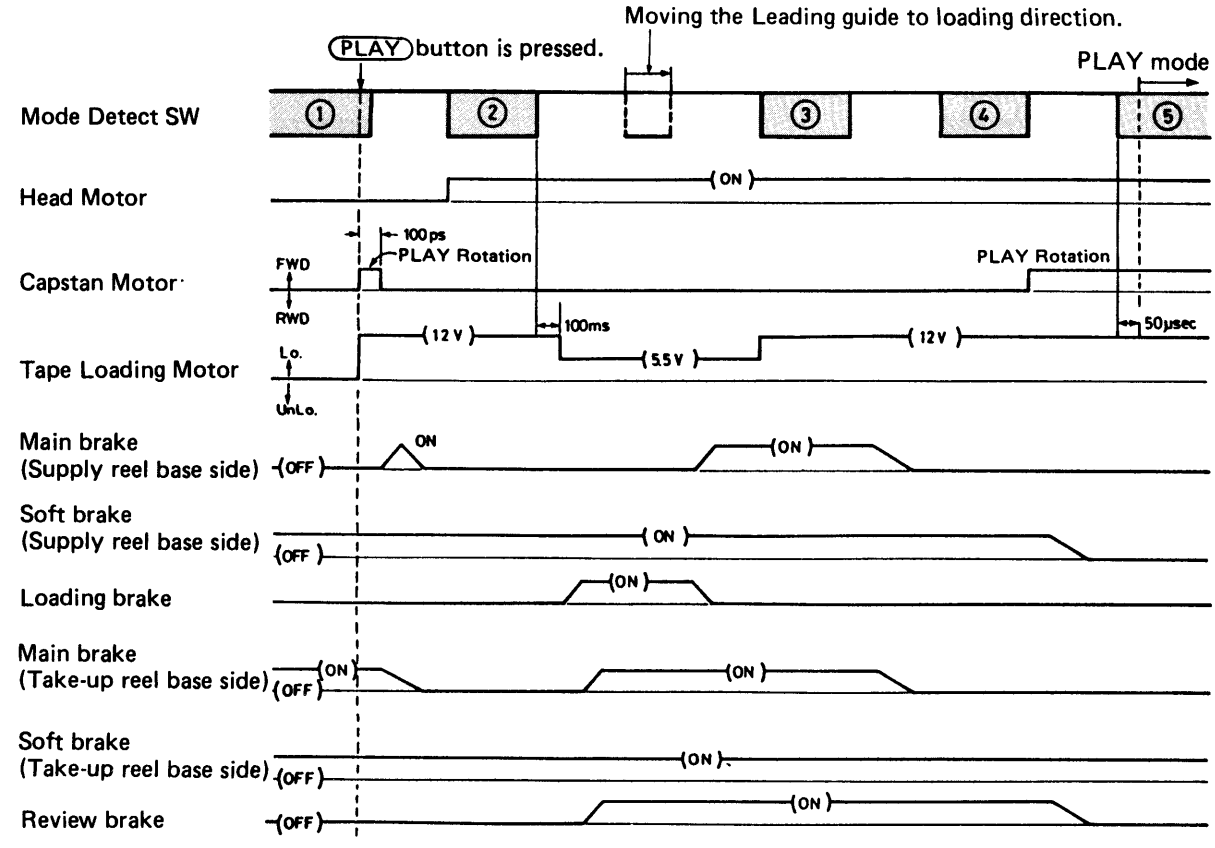


Table 1-5-1 Timing chart of from STOP mode to PLAY mode

1-5-2. From PLAY mode to R-SEARCH mode

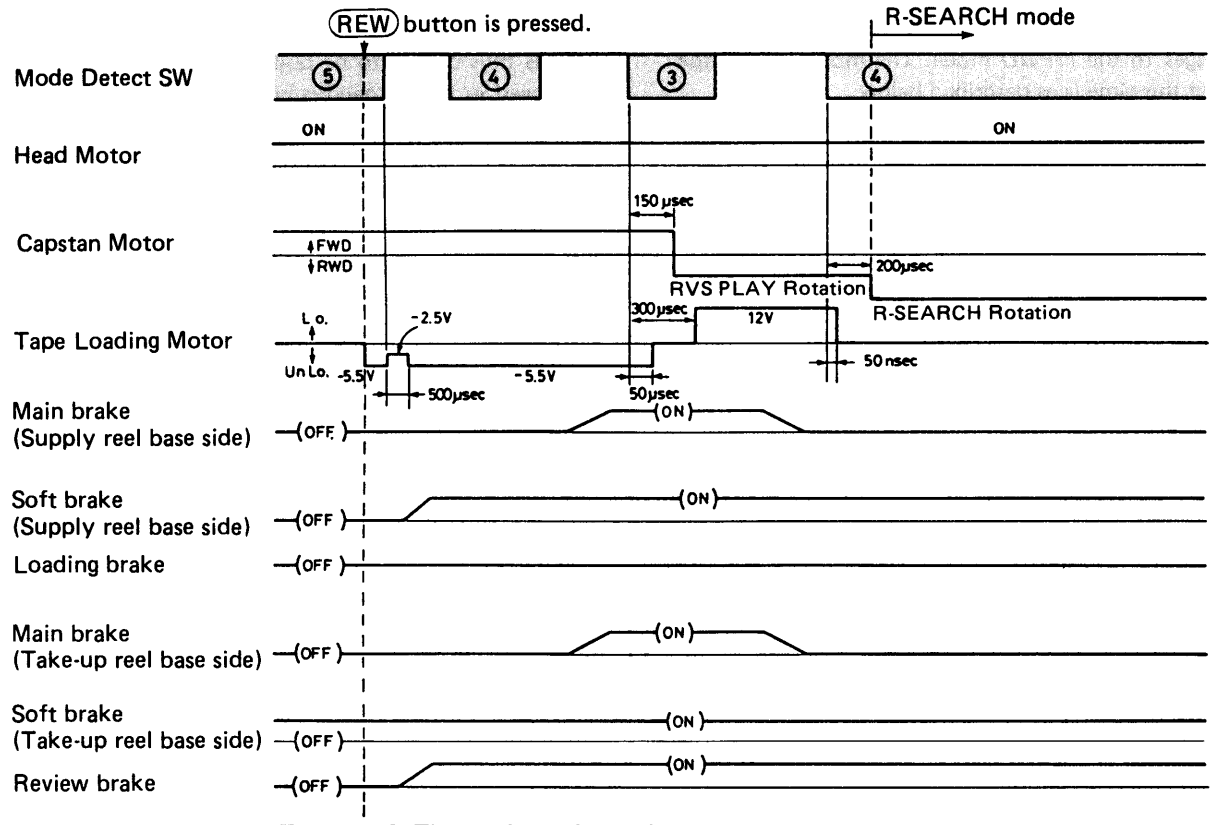


Table 1-5-2 Timing chart of from PLAY mode to R-SEARCH mode

1-5-3. From REC mode to REC PAUSE mode

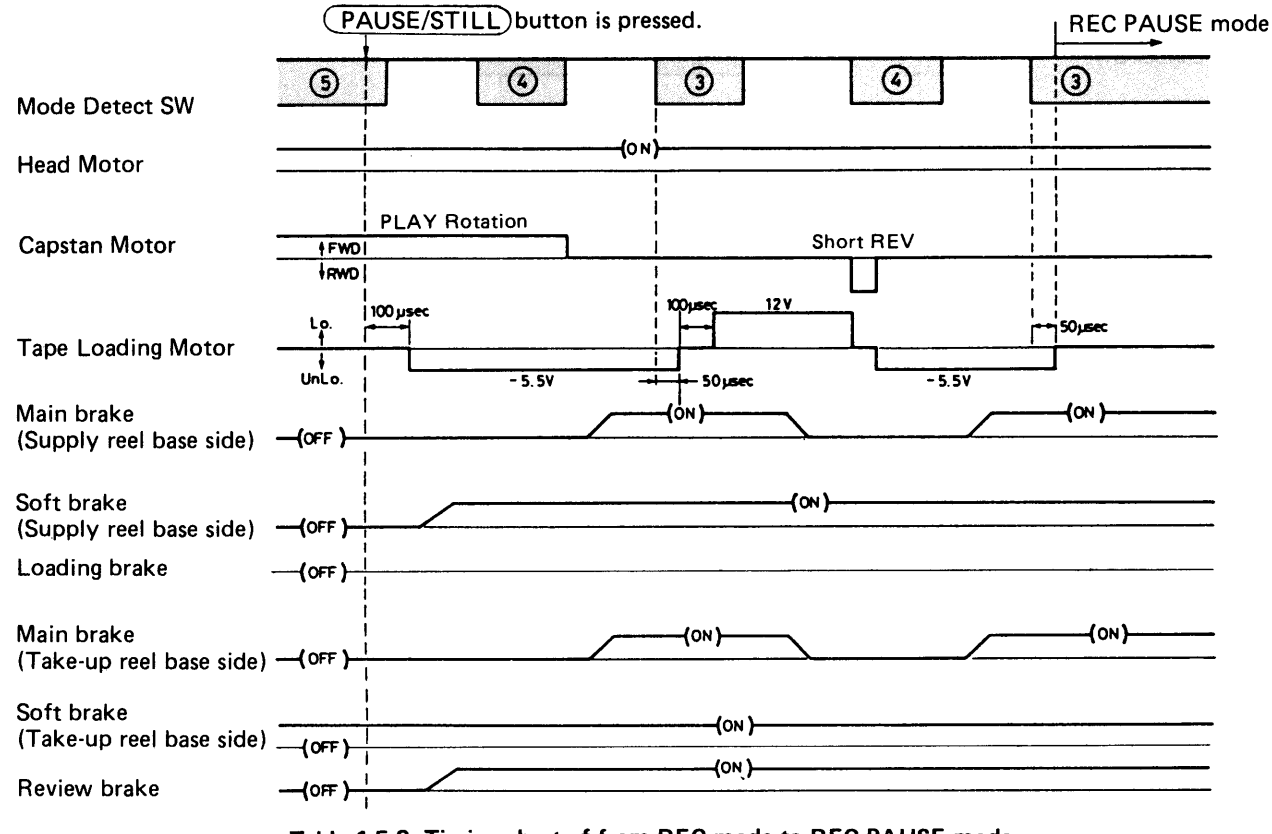


Table 1-5-3 Timing chart of from REC mode to REC PAUSE mode

1-5-4. From STOP mode to F-FWD mode
(See Fig. 1-5-1, Table 1-5-4)

When the FF button is pressed during the STOP mode, the mode changes to the F-FWD mode. The movement of the main gear at this time is as described below.

As a result of the movement of the sub slide in Fig. 1-5-1 in the direction of arrow ①, the FF lever is caused (by the hook of the sub slide) to move in the direction of sub slide ②.

The spring located between the FF lever and the direct lever is thus caused to be pulled, causing the direct lever to be moved in the perpendicular up direction, with the result that the main gear ③ is driven directly.

At the same time, the review gear is caused to move away from the main gear, with the result that the main gear rotates at high speed.

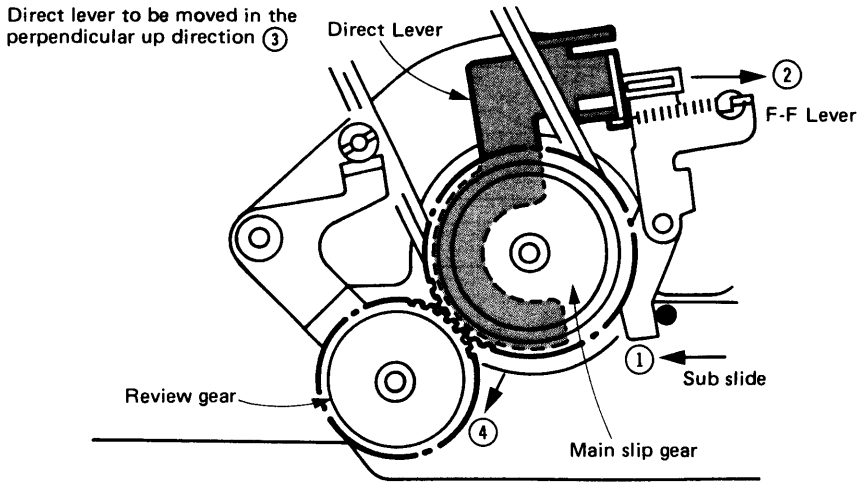


Fig. 1-5-1

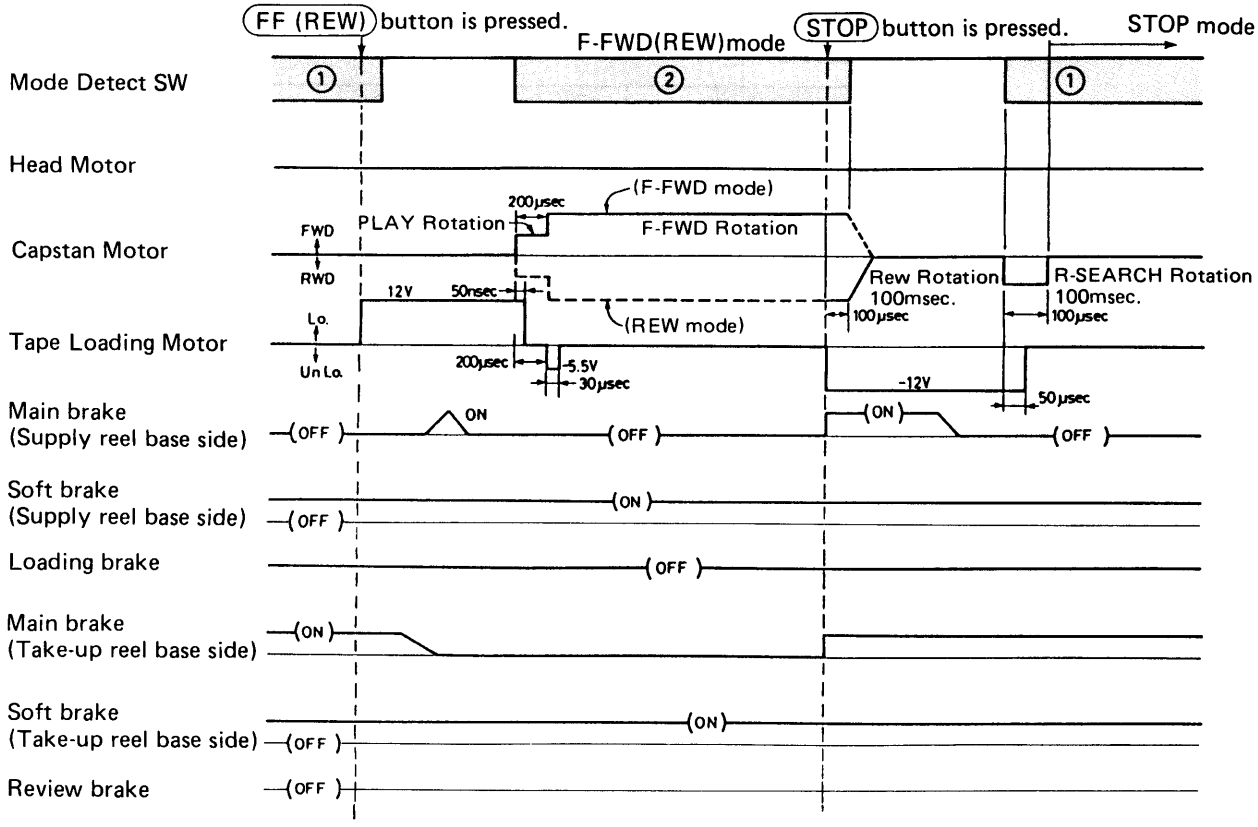


Table 1-5-4 Timing chart of from STOP mode to F-FWD (REW) mode

1-5-5 From PLAY mode to STOP mode

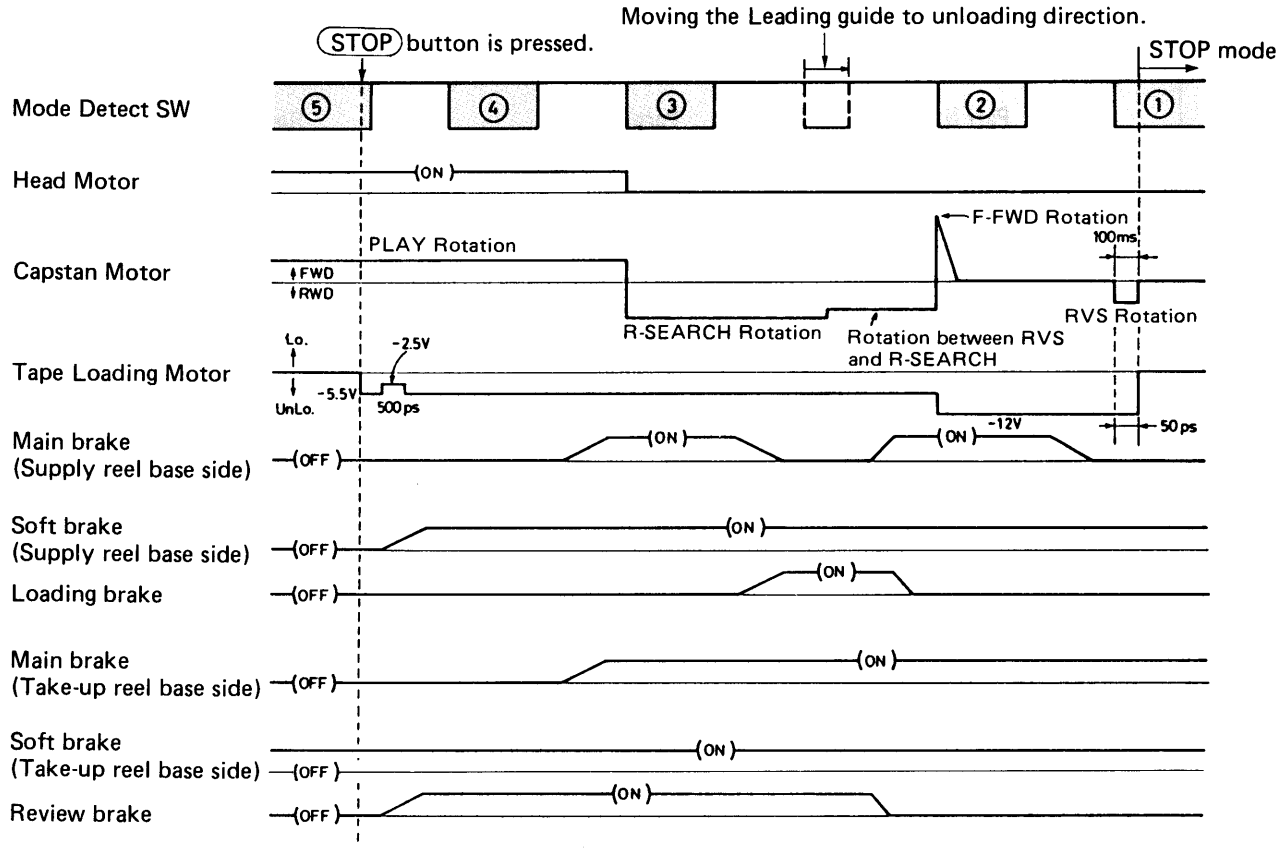


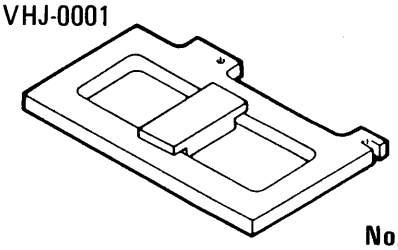
Table 1-5-5 Timing chart of from PLAY mode to STOP mode

2. MECHANISM ADJUSTMENTS

2-1. JIGS AND TOOLS FOR ADJUSTMENT

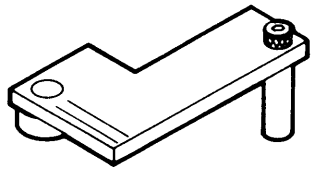
No.	Part Name	Part No.	Remarks
1	Cassette stand plate gauge	VHJ-0001	Adjustment of reel height
2	Position adjustment gauge	VHJ-0013	Adjustment of back tension guide (New)
3	Eccentric screwdriver	VJ-0017	Tape path alignment
4	Torque gauge driver	VHJ-0014	Adjustment of fixed screws (New)
5	Eccentric screwdriver	VHJ-0003	Tape path alignment
6	Hexagonal wrench (0.9mm)	VJ-0058	Adjustment of reel motor pulley height
7	Torque gauge	VHJ-0004	Measurement for all winding torque
8	Alignment tape	VHJ-0008	Color-bar. 1kHz
9	Alignment tape	VHJ-0009	Monoscope. 6kHz
10	Alignment tape	VHJ-0020	AF P.B level alignment (New)
11	Hexagonal wrench (1.27mm)	VJ-0108	Adjustment of loading motor pulley height
12	Cassette torque meter	VHJ-0016	Adjustment of back tension torque
13	Torque gauge driver	VHJ-0021	Adjustment of fixed order screw
14	Position adjustment gauge	VHJ-0024	Adjustment of tape sensor position

VHJ-0001



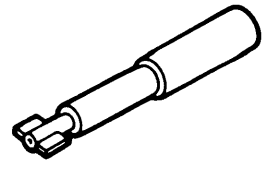
No. 1

VHJ-0013 (New)



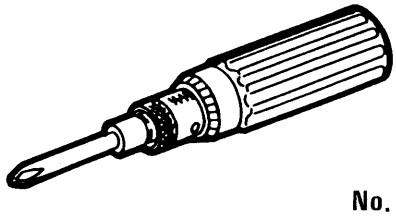
No. 2

VJ-0017



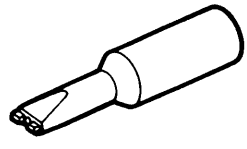
No. 3

VHJ-0014 (New)



No. 4

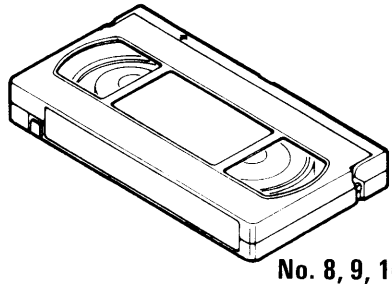
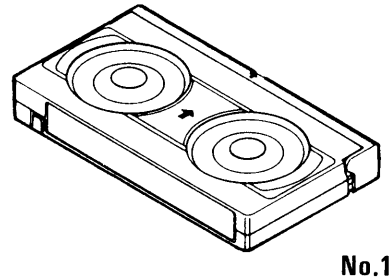
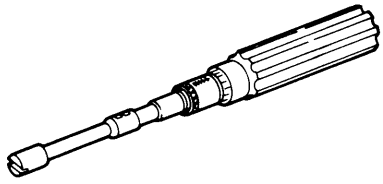
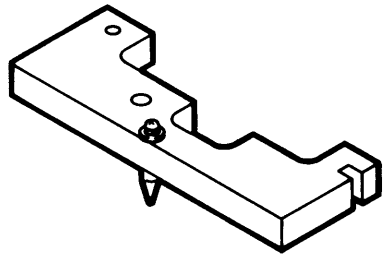
VHJ-0003



No. 5

VHJ-0058, VJ-0108

No. 6, 11

VHJ-0004 No. 7	VHJ-0008, VHJ-0009, VHJ-0020 (New  No. 8, 9, 10	VHJ-0016 (New)  No.12
VHJ-0021 (New)  No. 13	VHJ-0024  No. 14	

2-2. STANDARD MAINTENANCE TIMETABLE

In order to keep the VCR in peak working order, care for the parts indicated in **Table 2-2-1** at the periods given.

Parts \ Hours	500	1000	1500	2000	2500	3000	3500	4000	4500
VIDEO HEAD	○	○□	○	○□	○	○□	○	○□	○
AUDIO/CONTROL HEAD	○	○	○	○	○	○	○	○	○
FULL ERASE HEAD	○	○	○	○	○	○	○	○	○
CAPSTAN MOTOR	○	○	○	○	○	○□	○	○	○
PINCH ROLLER	○	○	○	○	○	○□	○	○	○
TAKE-UP REEL				▲			▲		
SUPPLY REEL				▲			▲		

○ : Cleaning □ : Parts replacement
▲ : Lubrication

Table 2-2-1

2-3. CLEANING

2-3-1. VIDEO HEAD (See Fig. 7-3-1.)

(1) Turn off the power. [Set the power switch to the OFF position.]
(2) Move the video head drum to a position at which the video heads are easy to clean.
(3) Wipe each head several times with the deerskin part of the head cleaning stick. If the heads are extremely dirty, wipe more times.

(Note)

- When pressing a finger on the head cleaning stick to clean the heads, do not press too hard.
- Do not move the head cleaning stick up and down against the video heads; doing so will damage the heads.

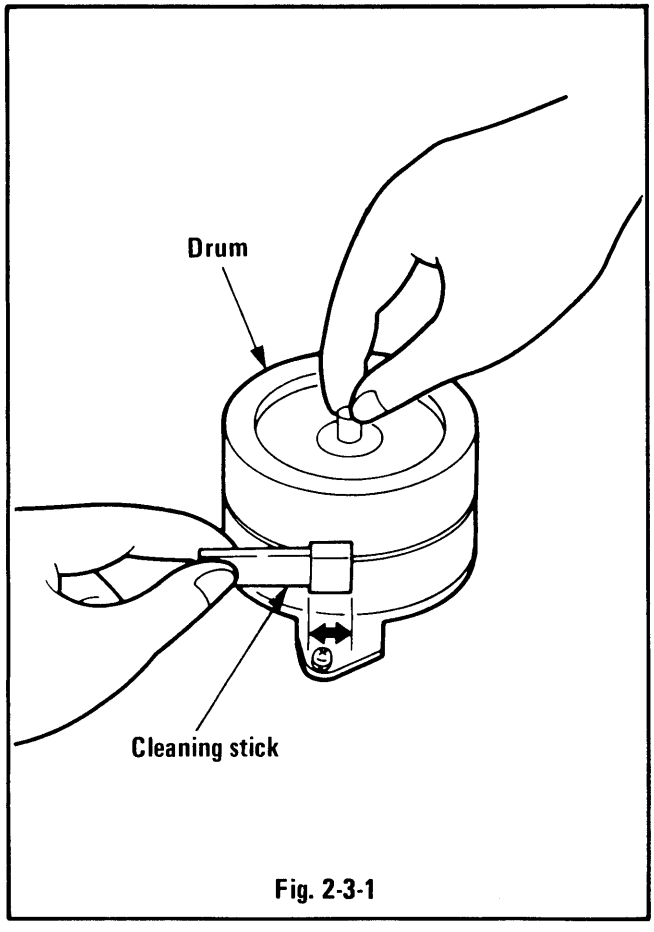


Fig. 2-3-1

2-3-2. TAPE PATH

Clean the surfaces of the tape guides and the drum tape path by using a soft cloth or cleaning stick moistened with an alcohol.

(Note)
When cleaning the drum surfaces, be careful not to contact the video heads.

2-3-3. PINCH ROLLER, CAPSTAN, SUPPLY AND TAKE-UP REEL BASE

(1) Using a soft cloth moistened with alcohol, clean the surfaces of the pinch roller, capstan, supply and take-up reel base.
(2) If there are scratches on the pinch roller, remove the E-ring and replace the pinch roller lever assembly.

2-3-4. CLEANING THE AUDIO/CONTROL HEAD AND FULL-ERASE HEAD (See Fig. 2-3-2, 2-3-3.)

Apply alcohol to the cleaning stick, and move the cleaning stick against the heads in the direction of the head gap.

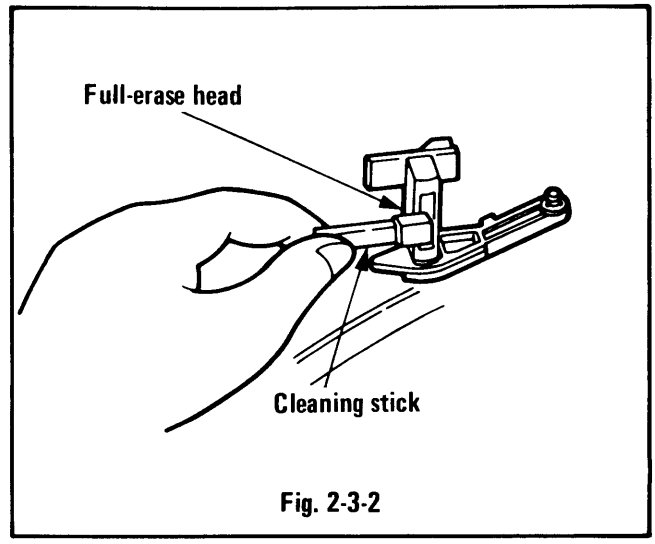


Fig. 2-3-2

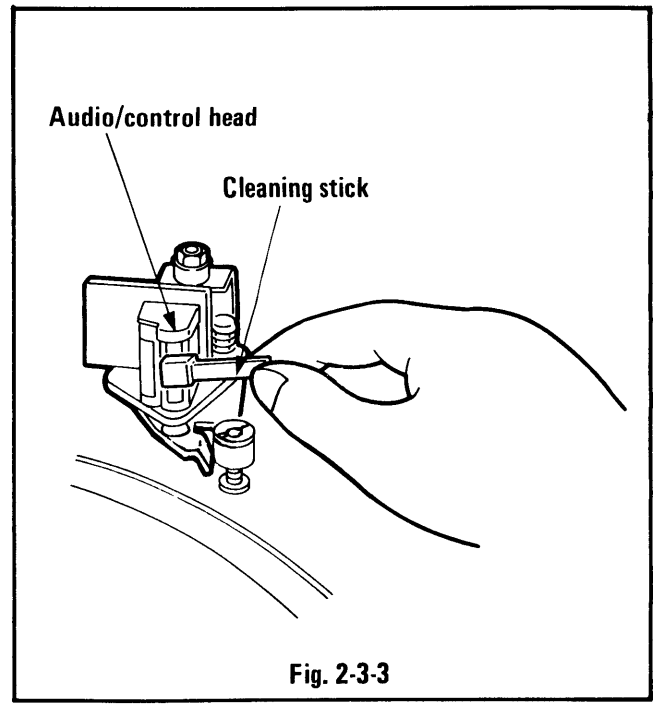


Fig. 2-3-3

2-4. MECHANISM REPAIR AND APRTS REPLACEMENT

2-4-1. BACK TENSION BRAKE BAND (See Fig. 2-4-1.)

(1) Remove the spring (a).
(2) Remove the screw (b) and washers (c), and then remove the brake band and backtension lever.
(3) Disconnect the brake band lever from the back tension lever.
(4) Install the new brake band by reversing the removal procedure.

(Note)
Be careful not to crease or scratch the new brake band.
(5) Adjust the position of the back tension lever.

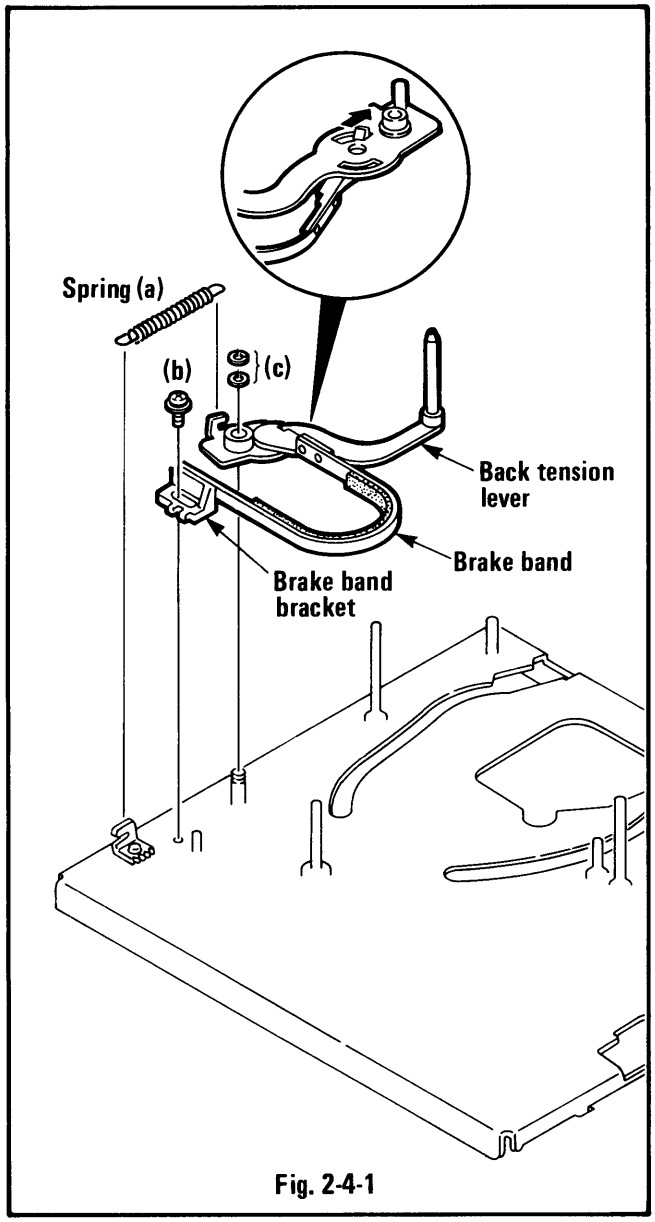


Fig. 2-4-1

2-4-2. FRONT LOADING MOTOR (See Fig. 2-4-2.)

(1) Disconnect the MC-32 printed circuit board from the solder terminals of the front loading motor.
(2) Remove the front loading motor belt.
(3) Remove the screws (a) which hold the front loading motor.
(4) Replace the front loading motor, and install it in the reverse order of removal.

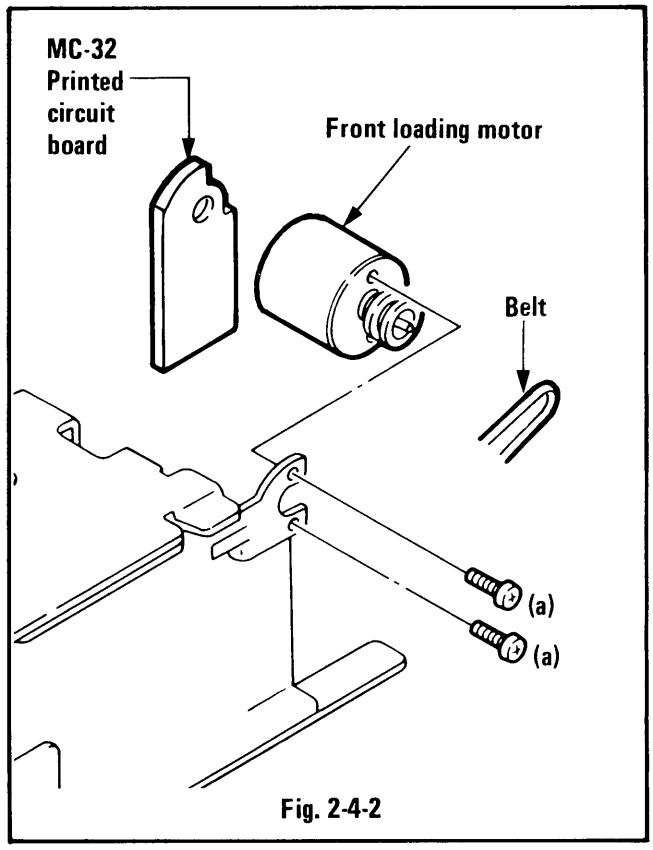


Fig. 2-4-2

2-4-3. SUPPLY REEL BASE (See Fig. 2-4-3.)

(1) Remove the fix screw of brake band. (refer to Fig. 2-4-1)
(2) Remove the spring (a), and then remove the supply soft brake.
(3) Remove the washer (b), and then remove the main srip gear.
(4) Remove the three screws (c), and then remove the bracket with roller assembly.
(5) Remove the supply reel base.

(Note)
Be careful not to lose the height adjustment spacer.

(6) Wipe off the old oil from the reel shaft by using a cloth moistened with alcohol, and then apply a small amount of new oil.
(7) If a new supply reel base is being installed, adjust the reel base height.

2-4-4. TAKE-UP REEL BASE (See Fig. 2-4-3.)

(1) Remove the one screw (c), and then remove the bracket.
(2) Remove the spring (d), and then remove the take-up soft brake.
(3) Remove the take-up reel base.

(Note)
Be careful not to lose the height adjustment spacer.

(4) Wipe off the old oil from the reel shaft by using a cloth moistened with alcohol, and then apply a small amount of new oil.
(5) If a new take-up reel base is being installed, adjust the reel base height.

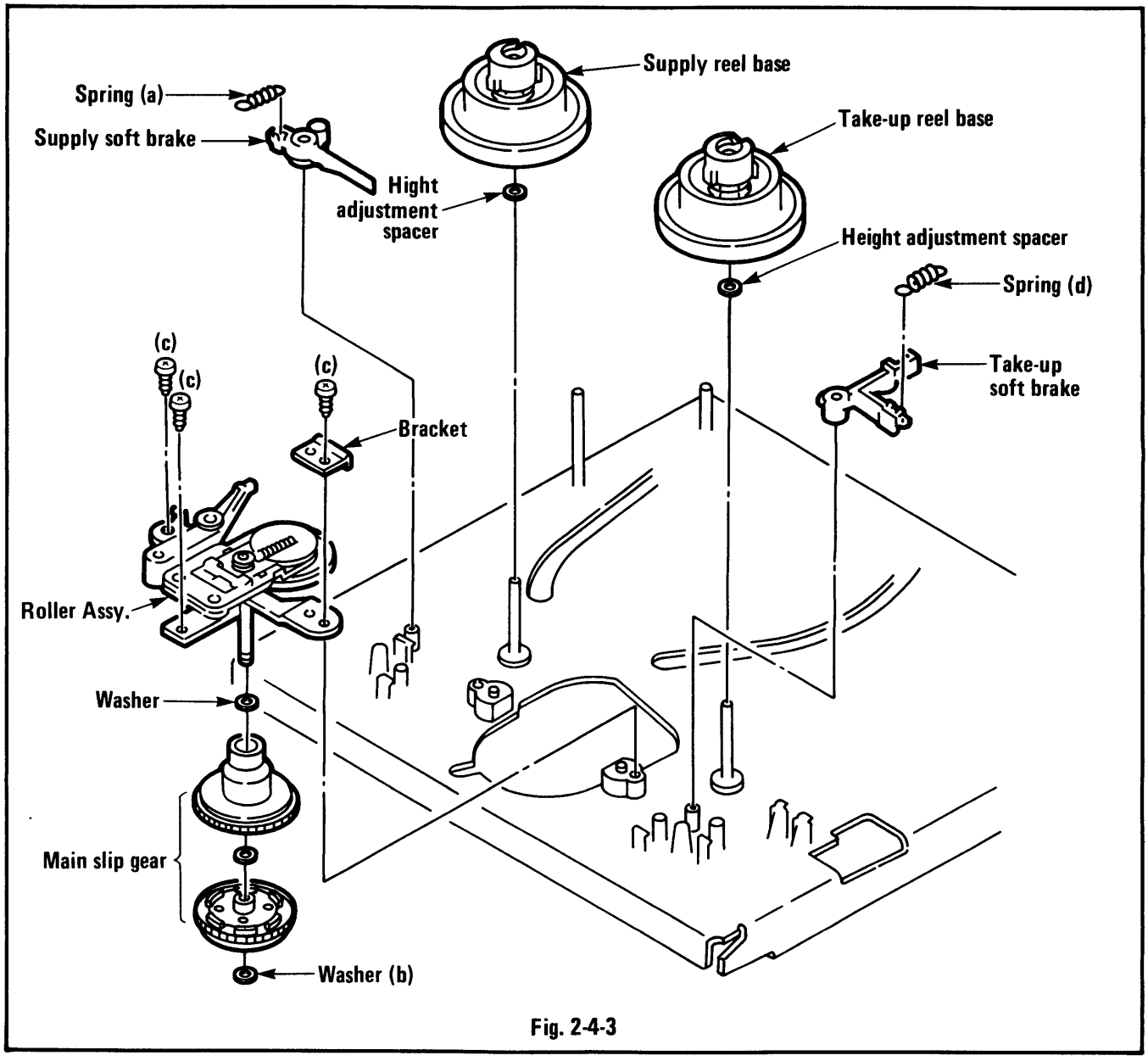


Fig. 2-4-3

2-4-5. CAPSTAN MOTOR (See Fig. 2-4-4.)

(1) Disconnect the capstan motor connector.

(Note)
Be sure that the power is off [the power switch in the OFF position] when connecting or disconnecting the connector.

(2) Remove the screws (a), and then remove the bracket.
(3) Remove the screws (b) securing the capstan motor, and then remove the motor.
(4) Install the new capstan motor by using the reverse order of the removal procedure.

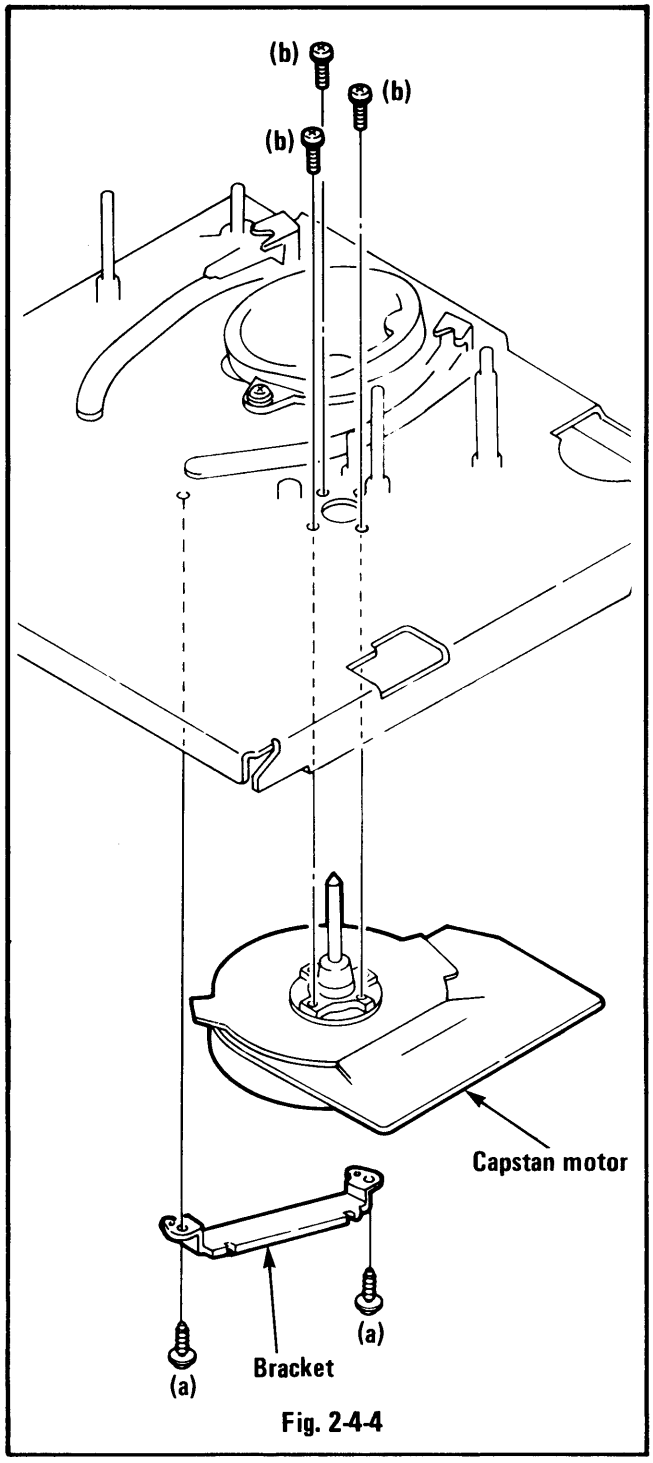


Fig. 2-4-4

2-4-6. ROLLER ASSEMBLY (See Fig. 2-4-5)

(1) Remove the washer (a), and than remove the roller assembly.
(2) Install the new roller assembly by using the reverse order of the removal procedure.

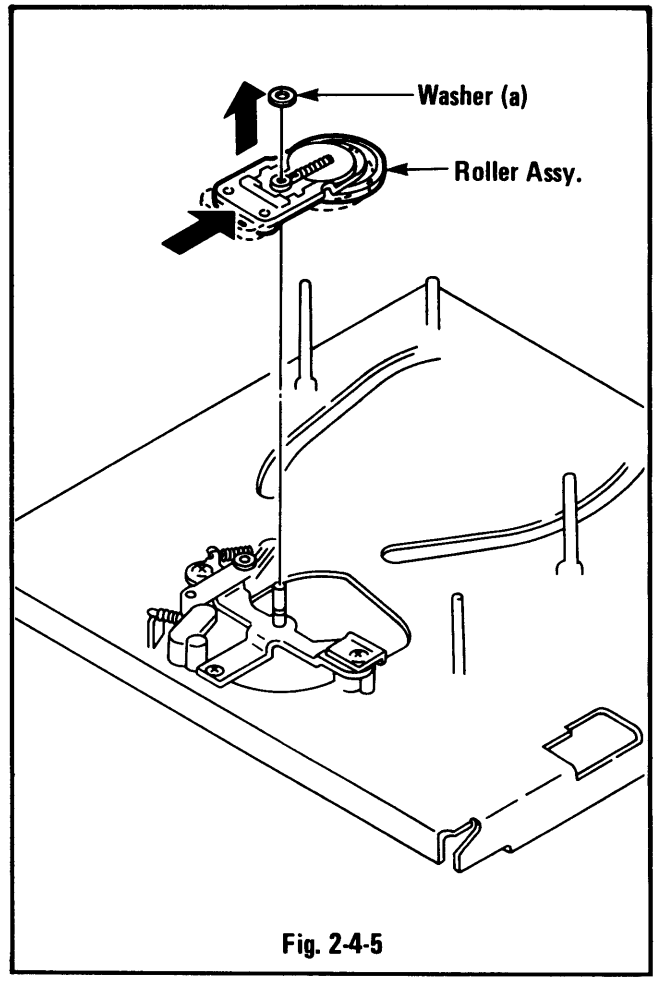


Fig. 2-4-5

2-4-7. UPPER DRUM (See Fig. 2-4-6.)

(Models VHR-2100EX, VHR-2300 EX, G)

(1) Remove the screw (a), then remove the brush.

(2) Remove the screws (b) which hold the upper drum, and than remove the soldered lead wire.

(Note)

Be careful to the solder the lead wire at correct position.

(3) Check the tape path.

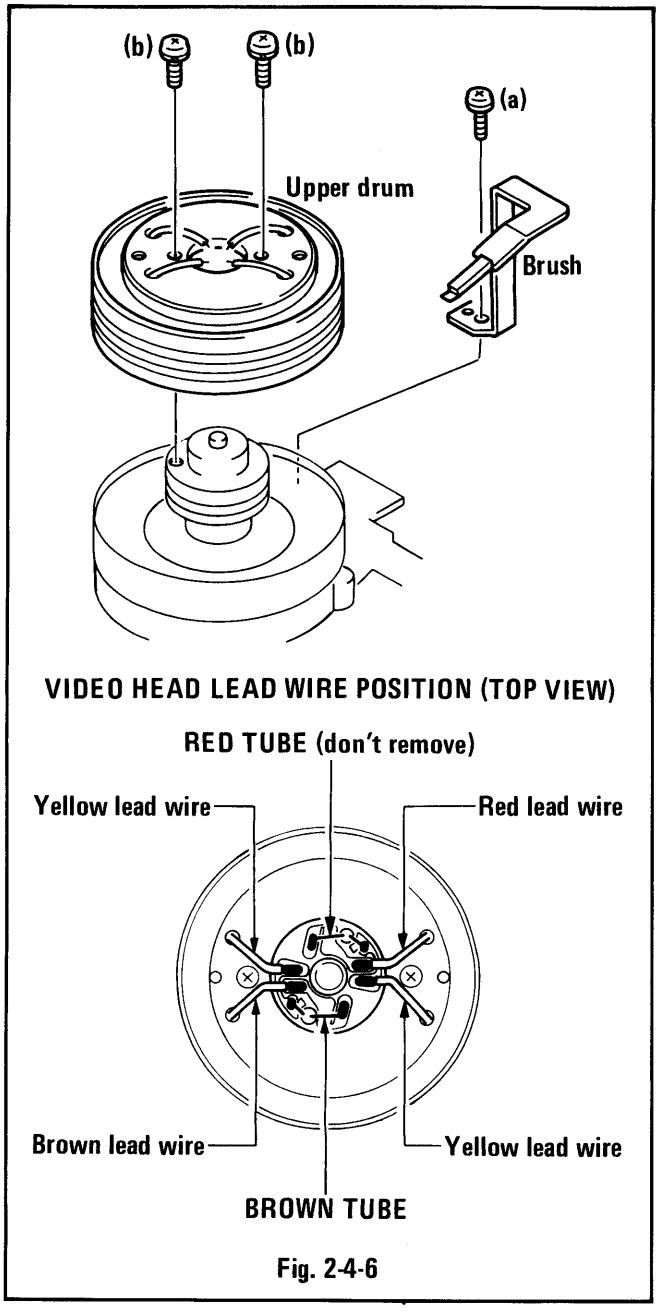


Fig. 2-4-6

2-4-8. DRUM MOTOR (See Fig. 2-4-7.)

(Models VHR-2100 EX, VHR-2300 EX, G)

(1) Remove the screws (a) securing the rotor, and then remove the rotor.

(2) Remove the screws (b) securing the stator, and then remove the stator.

(3) Install the new drum motor by using the reverse order of the removal procedure.

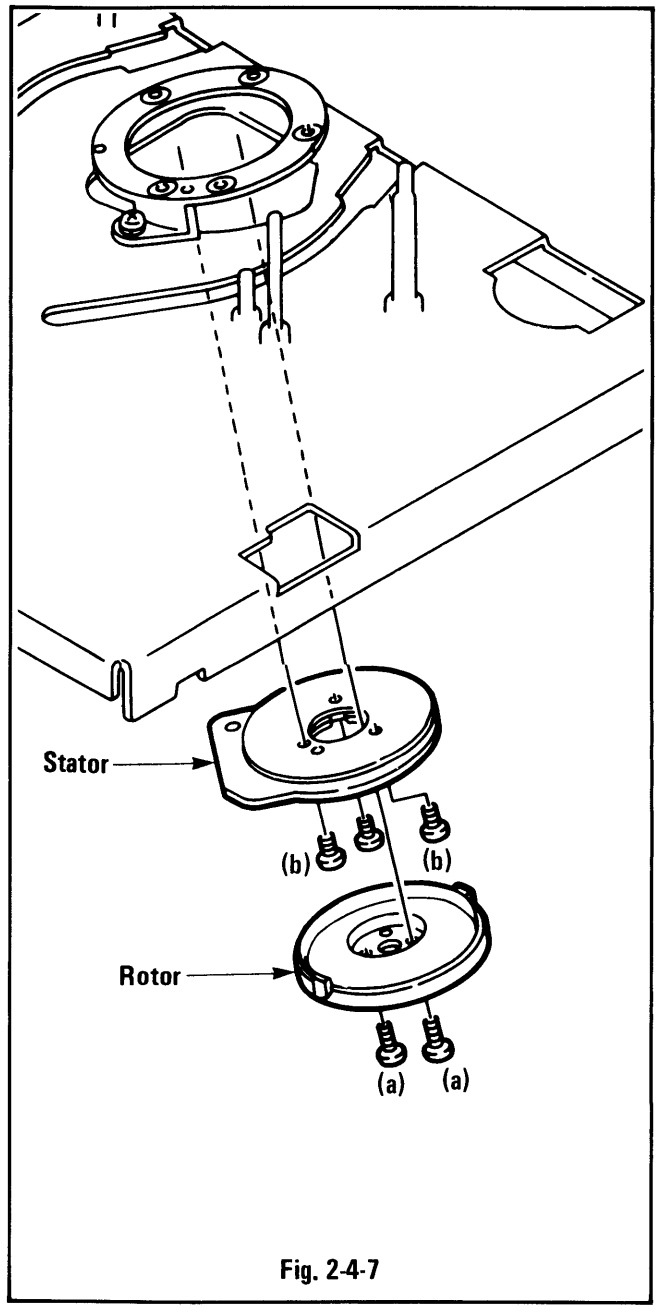


Fig. 2-4-7

(Note)

Use the torque gauge screwdriver (VHJ-0014) for installation of the stator and rotor.

The tightening torque of the stator is 3kg-cm, and for the rotor is 2kg-cm. (When installing, first tighten to a temporary tightness and then tighten to the specified torque.)

2-4-9. DRUM ASSY. (See Fig. 2-4-8.)

(Models VHR-2100 EX, VHR-2300EX, G)

(1) Remove the screw (a), and then remove the brush.
(2) Remove the screws (b), and then remove the shield plate.
(3) Remove the soldered lead wire of MC-30.
(4) Remove the screws (c), and then remove the drum assembly.
(Be careful not contact the video heads)
(5) Install the new drum assembly by using the reverse order of the removal procedures.

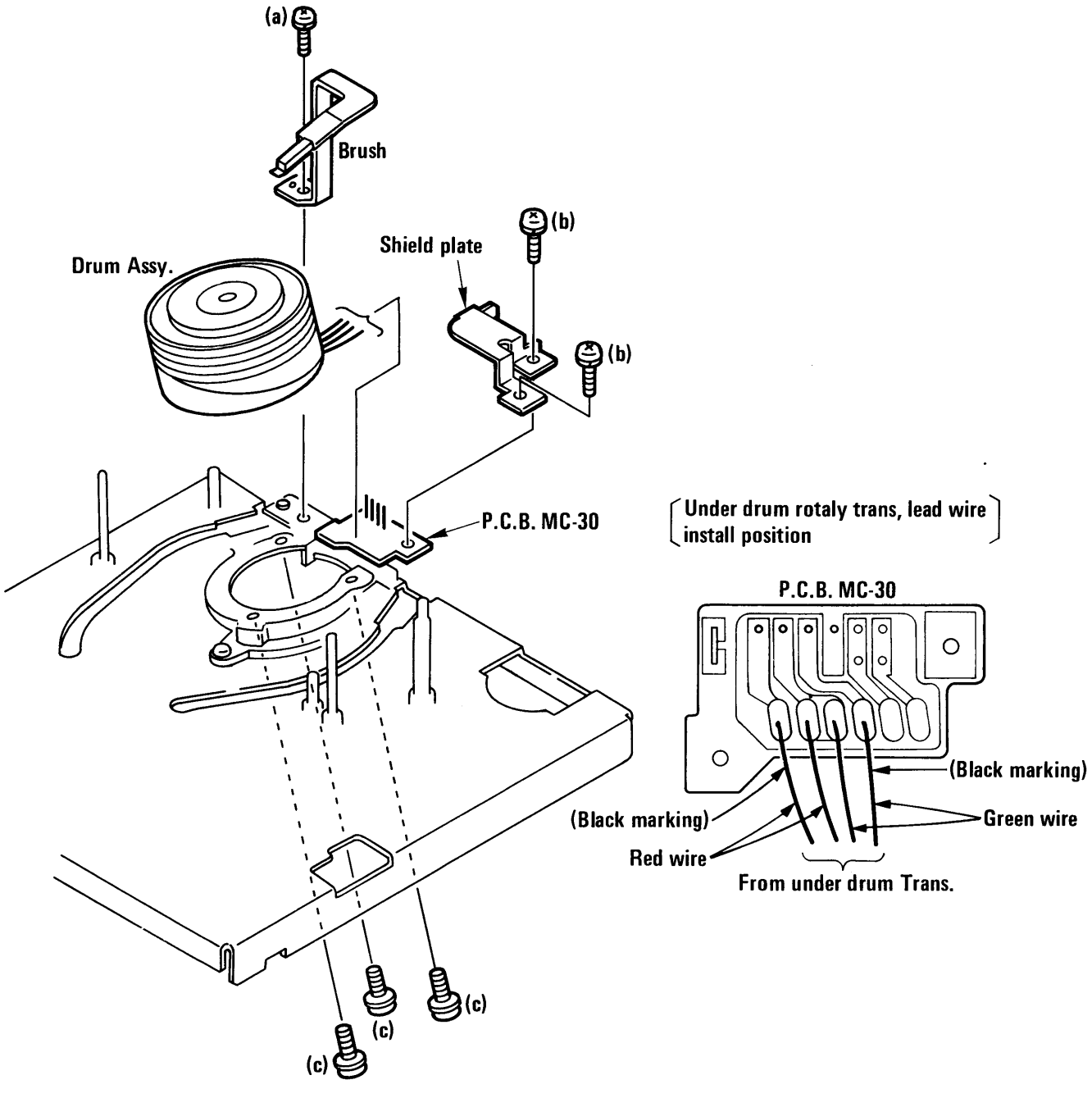


Fig. 2-4-8

2-4-10. UPPER DRUM (See Fig. 2-4-9.)

Models VHR-1110, VHR-2100, VHR-2300, VHR-2500 series and VHR-1700M, VHR-2350EE except models VHR-2100EX, VHR-2300EX, G.

(1) Remove the screws (a) which hold the upper drum, and then remove the soldered lead wire.

(Note)

Be careful to the solder the lead wire at the correct position.

(2) Check the tape path.

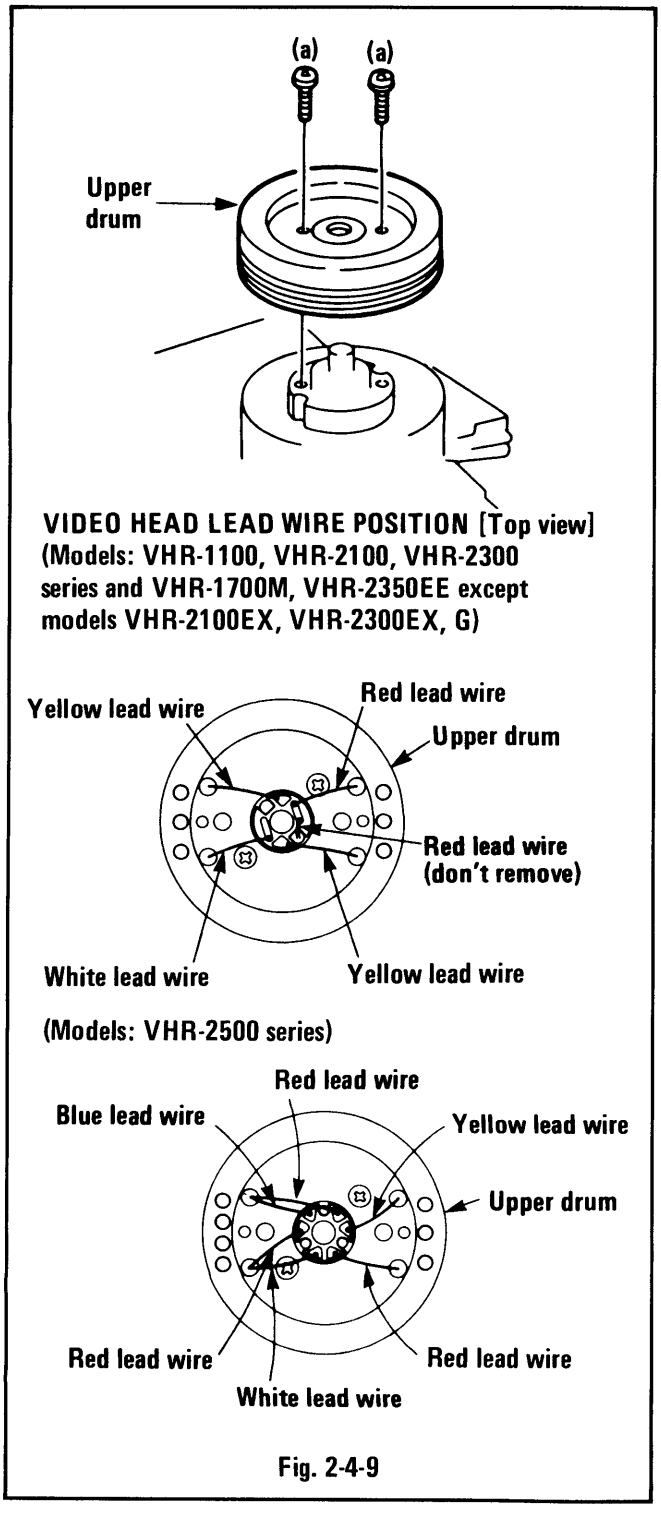


Fig. 2-4-9

2-4-11. DRUM MOTOR (See Fig. 2-4-10.)

Models VHR-1110, VHR-2100, VHR-2300, VHR-2500 series and VHR-1700M, VHR-2350EE except models VHR-2100EX, VHR-2300EX, G.

(1) Remove the screws (a), than remove the brush.

(2) Remove the screws (b) securing the rotor, and then remove the rotor.

(3) Remove the screws (c) securing the stator, and then remove the stator.

(4) Install the new drum motor by using the reverse order of the removal procedure.

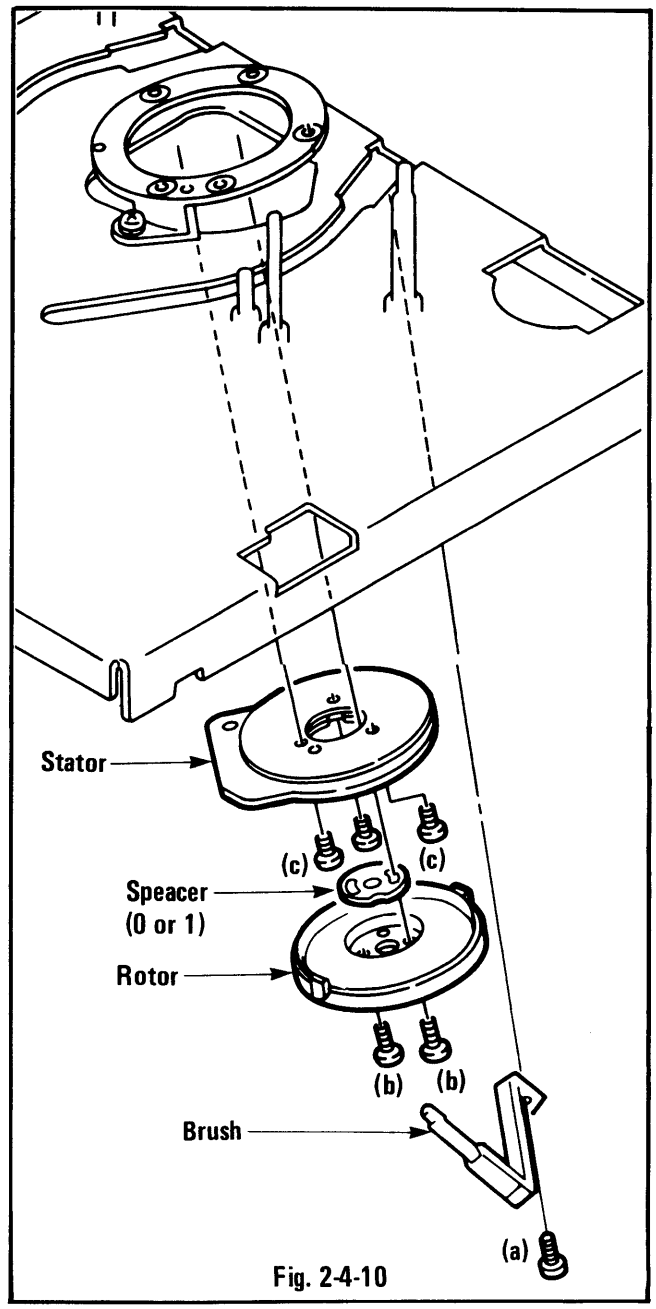


Fig. 2-4-10

(Note)

- Use the torque gauge screwdriver (VHJ-0014) for installation of the stator and rotor.

The tightening torque of the stator is 3 kg-cm, and for the rotor is 2 kg-cm. (When installing, first tighten to a temporary tightness and then tighten to the specified torque.)

2-4-12. DRUM ASSY. (See Fig. 2-4-11.)

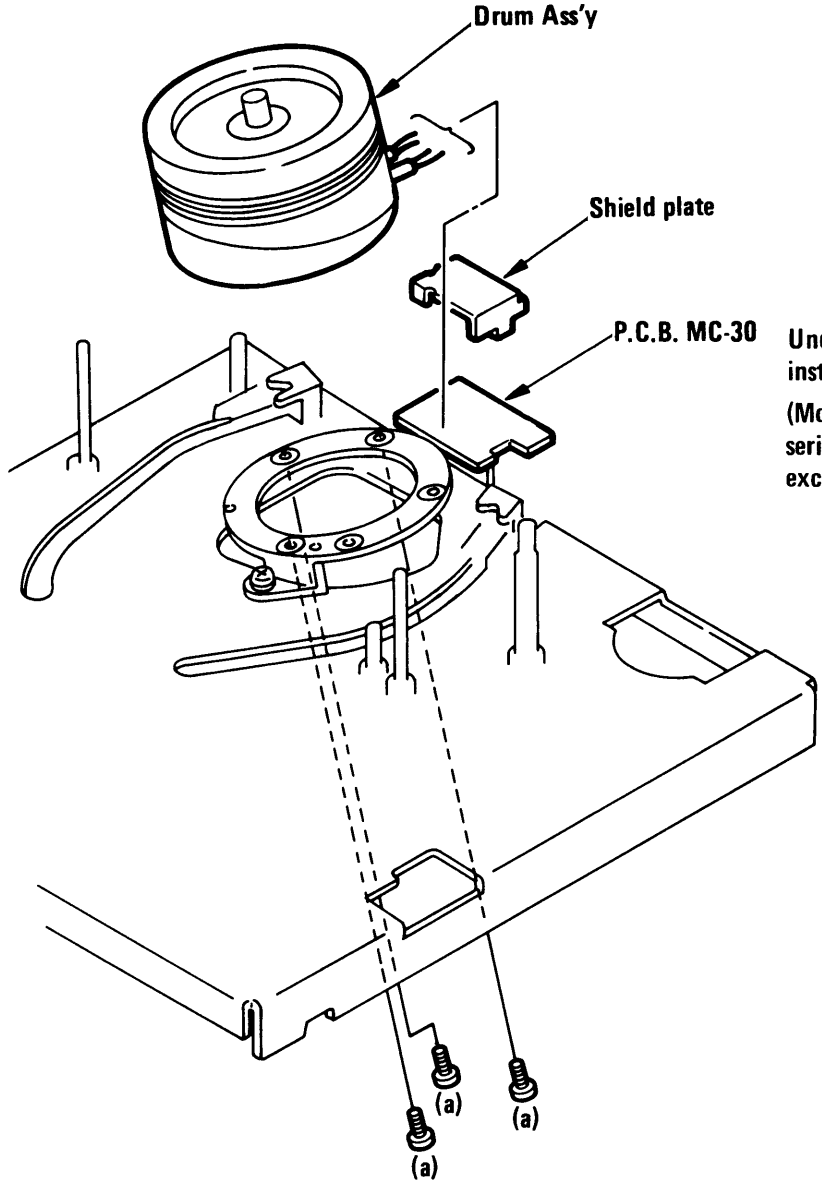
Models VHR-1110, VHR-2100, VHR-2300, VHR-2500 series and VHR-1700M, VHR-2350EE except models VHR-2100EX, VHR-2300EX, G.

(1) Remove solder of MC-30, and then remove the shield plate.

(2) Remove the soldered lead wire of MC-30.

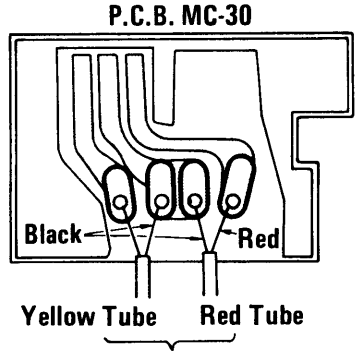
(3) Remove the screws (a), and then remove the drum assembly.
(Be careful not contact the video heads)

(4) Install the new drum assembly by using the reverse order of the removal procedures.



Under Drum Rotary Trans. lead wires install position

(Models VHR-1110, VHR-2100, VHR-2300 series and VHR-1700M, VHR-2350EE except models VHR-2100EX, VHR-2300EX, G)



(Models VHR-2500 series)

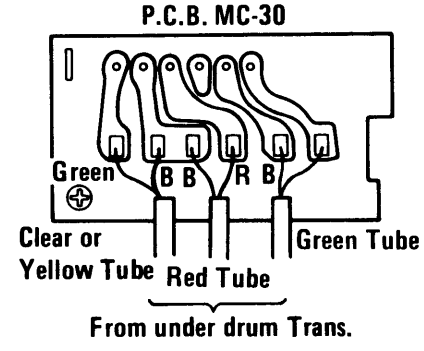


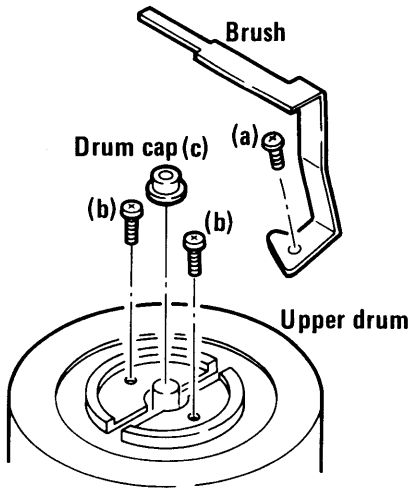
Fig. 2-4-11

2-4-13. UPPER DRUM
(VHR-2700 series only See Fig. 2-4-12.)

(1) Remove the screw (a), than remove the brush.
(2) Remove the screws (b) which hold the upper drum, and then remove the soldered lead wire.
(3) Remove the drum cap (c).

(Note)
Be careful to the solder the lead wire at the correct position.

(4) Check the tape path.



VIDEO & AF HEAD LEAD WIRE POSITION (Top View)

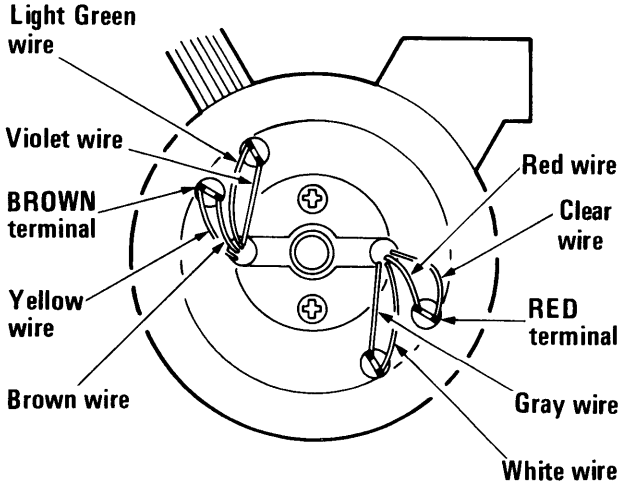


Fig. 2-4-9

2-4-14. DRUM ASSY.
(VHR-2700 series only See Fig. 2-4-13.)

(1) Remove the video-preamp (VP-1). Next, disconnect the 14 pin socket (a) from MC-4 P.C.Board.
(2) Remove the screw (b), and than remove the brush.
(3) Remove the two screws (c), and than remove the shield plate.
(4) Remove the soldered 8 lead wired of MC-30 P.C.Board. [See Fig. 2-4-13A]
(5) Remove the three screws (d), than remove the drum base (with drum assembly) from mechanism chassis. Next, disconnect the 4 pin socket of MC-30 P.C.Board.
(6) Remove the soldered 4 lead wires of MC-4 P.C.Board. [See Fig. 2-4-13B]
(7) Remove the two screws (e), and than remove the MC-4 P.C.Board from drum base. Next, than disconnect the under drum and MC-4 P.C.Board.
(8) Remove the three screws (f), and than remove the drum assembly from drum base.
(9) Install the new drum assembly by using the reverse order of the removal procedures.
(10) Check the tape path.

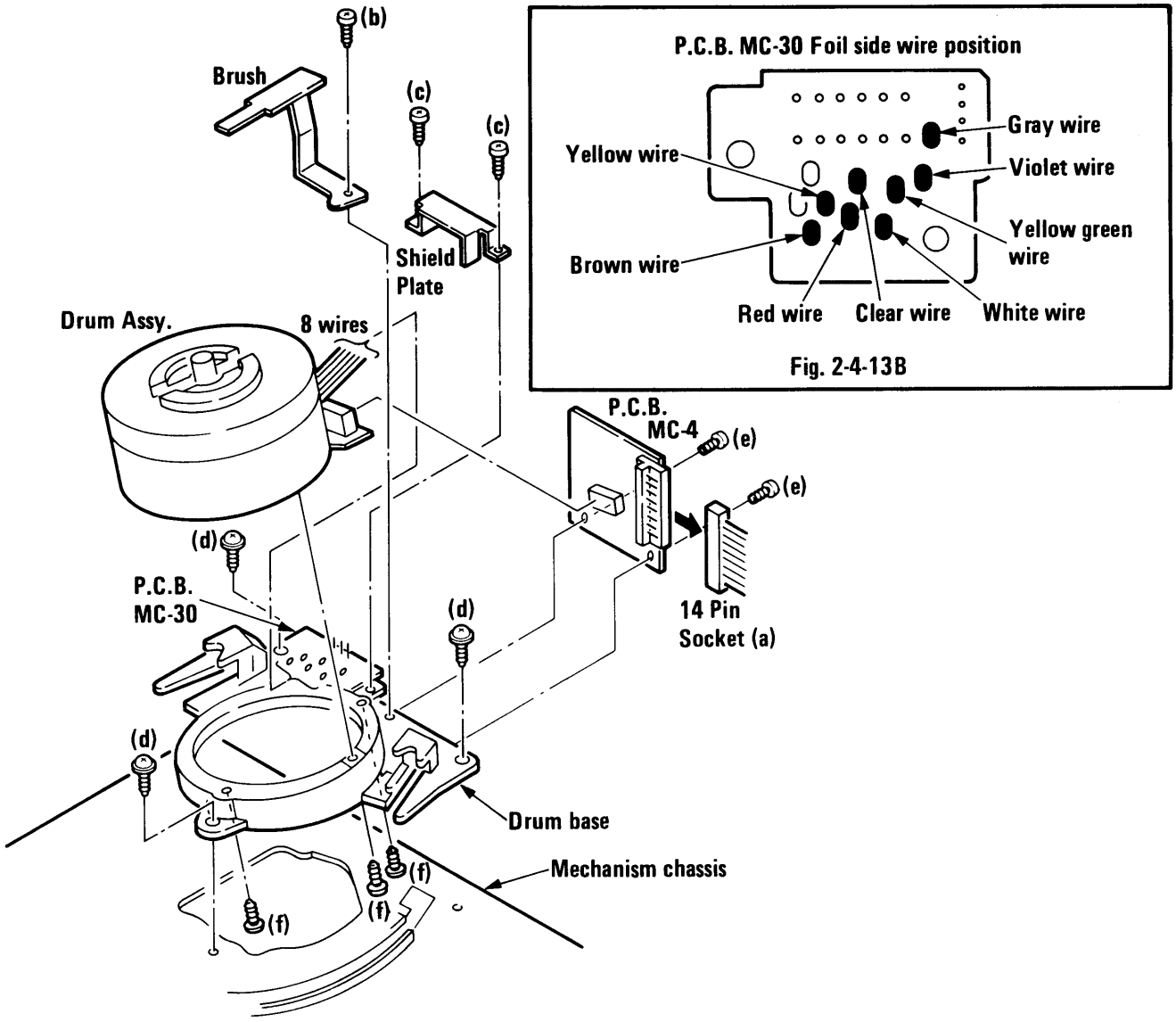


Fig. 2-4-13B

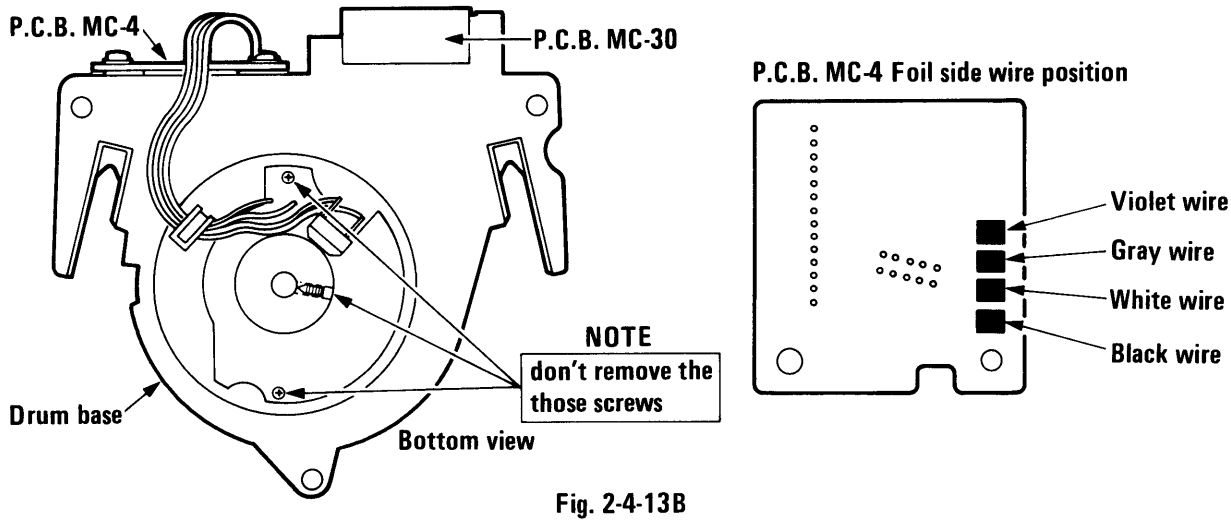


Fig. 2-4-13B

Fig. 2-4-13

2-4-15. AUDIO/CONTROL HEAD ASSEMBLY (See Fig. 2-4-14.)

(1) Remove the nut (a) and sleeve (b) which hold the audio/control head assembly, and then disconnect the connector.
(2) Install the new audio/control head assembly.
(3) Adjust the tape path.

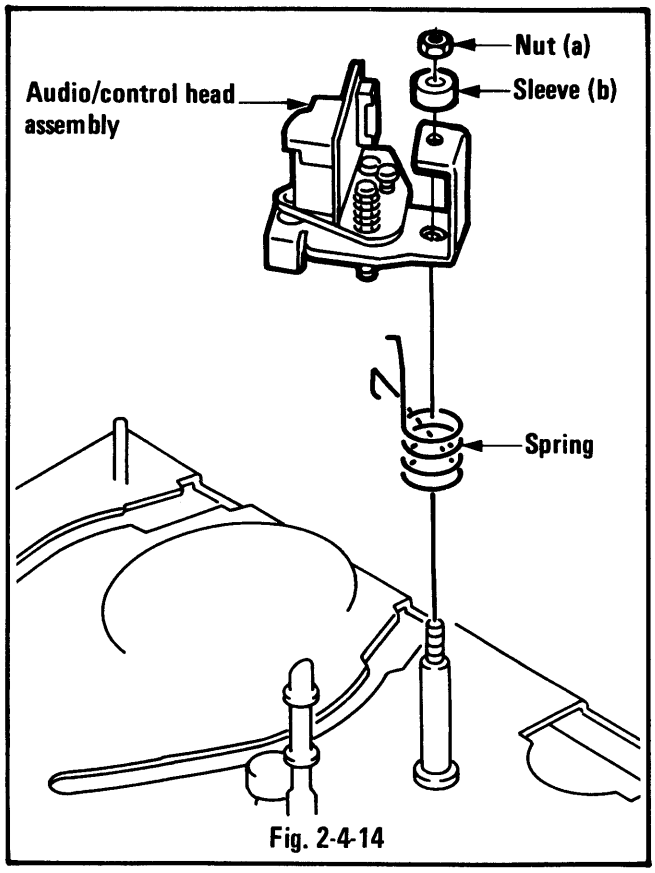


Fig. 2-4-14

2-4-16. FULL-ERASE HEAD ASSEMBLY (See Fig. 2-4-15.)

(1) Remove the E-ring which hold the full-erase head assembly, and then disconnect the connector.
(2) Install the new full-erase head assembly.

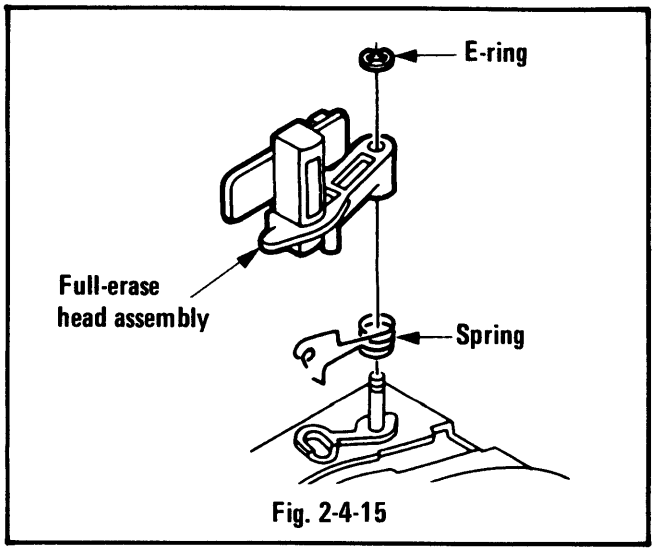


Fig. 2-4-15

2-4-17. LOADING MOTOR (See Fig. 2-4-16.)

(1) Disconnect the loading motor connector.
(2) Remove the loading motor bracket screws (a), and then remove the loading motor assembly.
(3) Remove the loading belt.
(4) Remove the screws (b) which secure the loading motor, and then remove the motor.
(5) Loosen the set screw (c) which secures the loading motor pulley by using the hexagonal wrench (VJ-0108), and then remove the pulley.

(Note)
When mounting the pulley, be sure to adjust the height.
(6) Install the loading motor pulley by using the reverse order of the removal procedure.

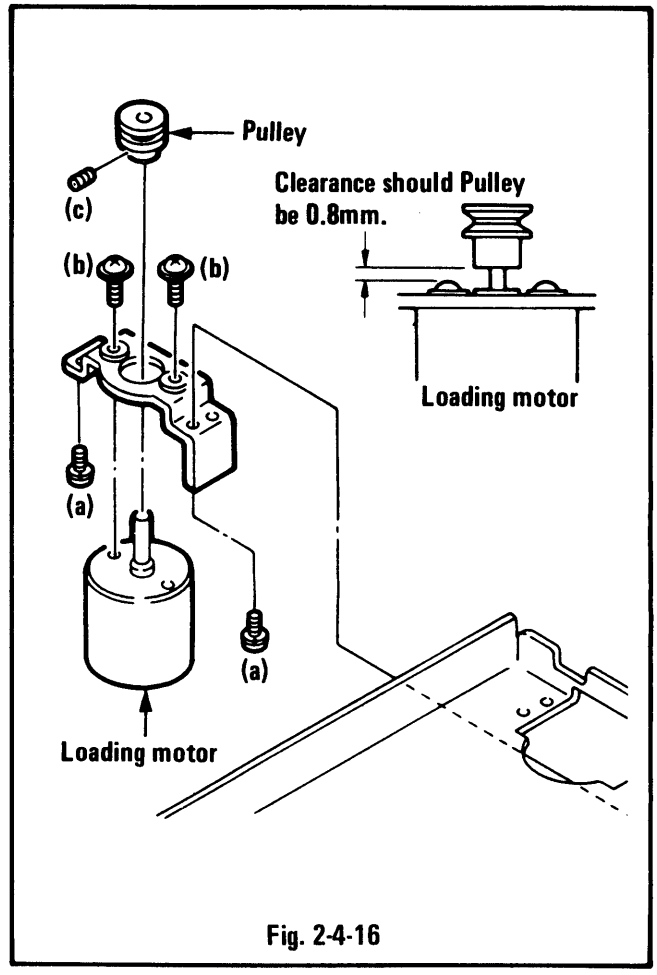


Fig. 2-4-16

2-5. PREPARATIONS FOR ADJUSTMENT (See Fig. 2-5-1.)

How to operate the mechanism without a tape cassette

1. Cover the FWD sensor and REW sensor using a piece of black vinyle tape or similar material so that light cannot be received.
2. Insert the tape cassette by hand, and then pull it out when the cassette tray begins to move.
3. In this condition, each mode can be operated.

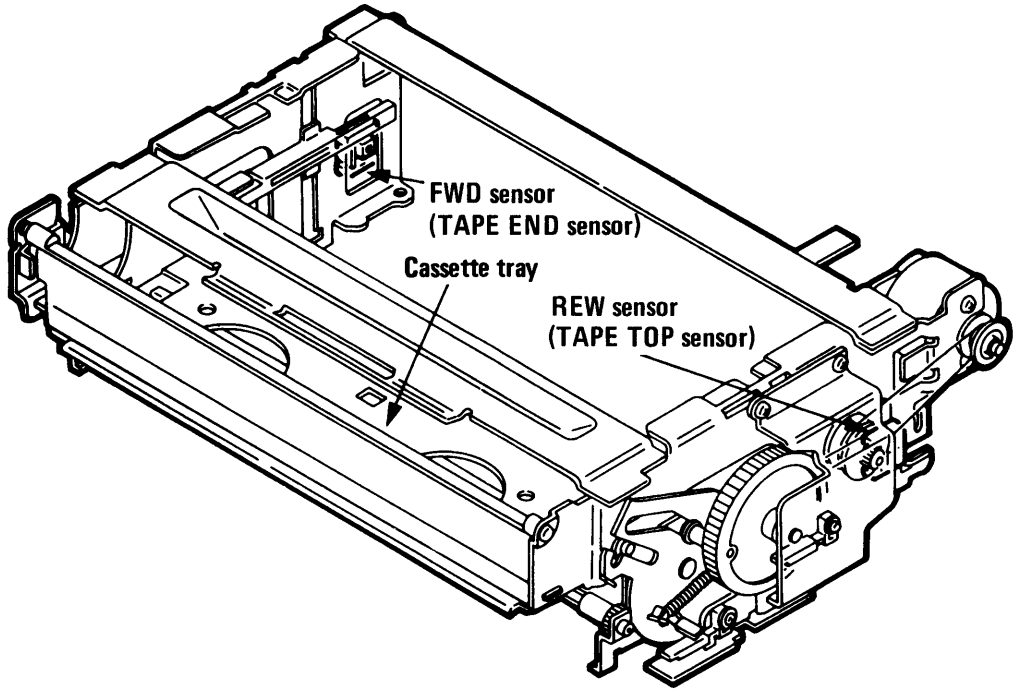


Fig. 2-5-1

2-6. ADJUSTMENTS

2-6-1. REEL BASE HEIGHT (See Fig. 2-6-1.)

If the supply reel base or the take-up reel base is replaced, it will be necessary to adjust the reel base height.

(1) Attach the cassette stand plate gauge (VHJ-0001) and slide the gauge in the direction of the arrows.

(2) Confirm that, when the gauge stops, the reel bases are not in contact with surface A of the plate and are in contact with surface B.

(3) If the reel base is in contact with surface A, remove a spacer and check again.

(4) If the reel base is not in contact with surface B, add a spacer and check again.

(Note)

Adjust the reel base height by adding or removing spacers (0.13t, 0.2t, 0.25t and 0.5t) as appropriate so that the height meets the specifications. Use the same method for both the take-up reel base and the supply reel base.

(The 0.5t washer is included as the standard washer.)

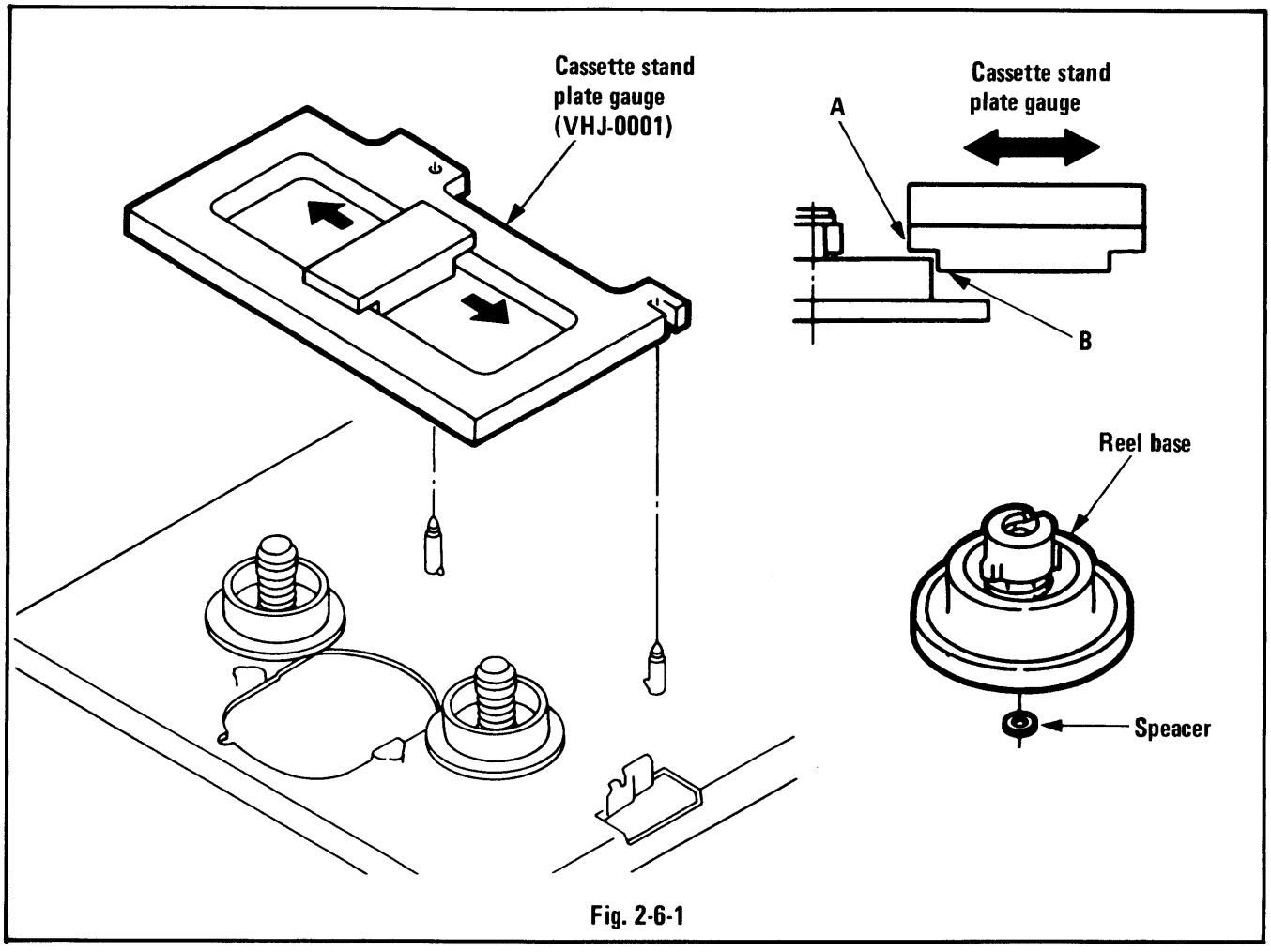


Fig. 2-6-1

2-6-2. BACK-TENSION LEVER POSITIONING (See Fig. 2-6-2.)

(1) Begin the playback mode without inserting a tape cassette. After loading finishes, disconnect the power cord from the power outlet.

(2) Attach the back-tension lever position-confirmation gauge (VHJ-0013).

(3) Check to be sure that the back-tension lever is within the marking line on the back-tension lever position-confirmation gauge.

(4) If is not, adjust the screw (a) so that it is with in the line.

(5) Remove the back-tension lever position-confirmation gauge.

(Note)

Handle the back-tension lever position-confirmation gauge carefully when attaching and removing it, so as not to damage the video heads.

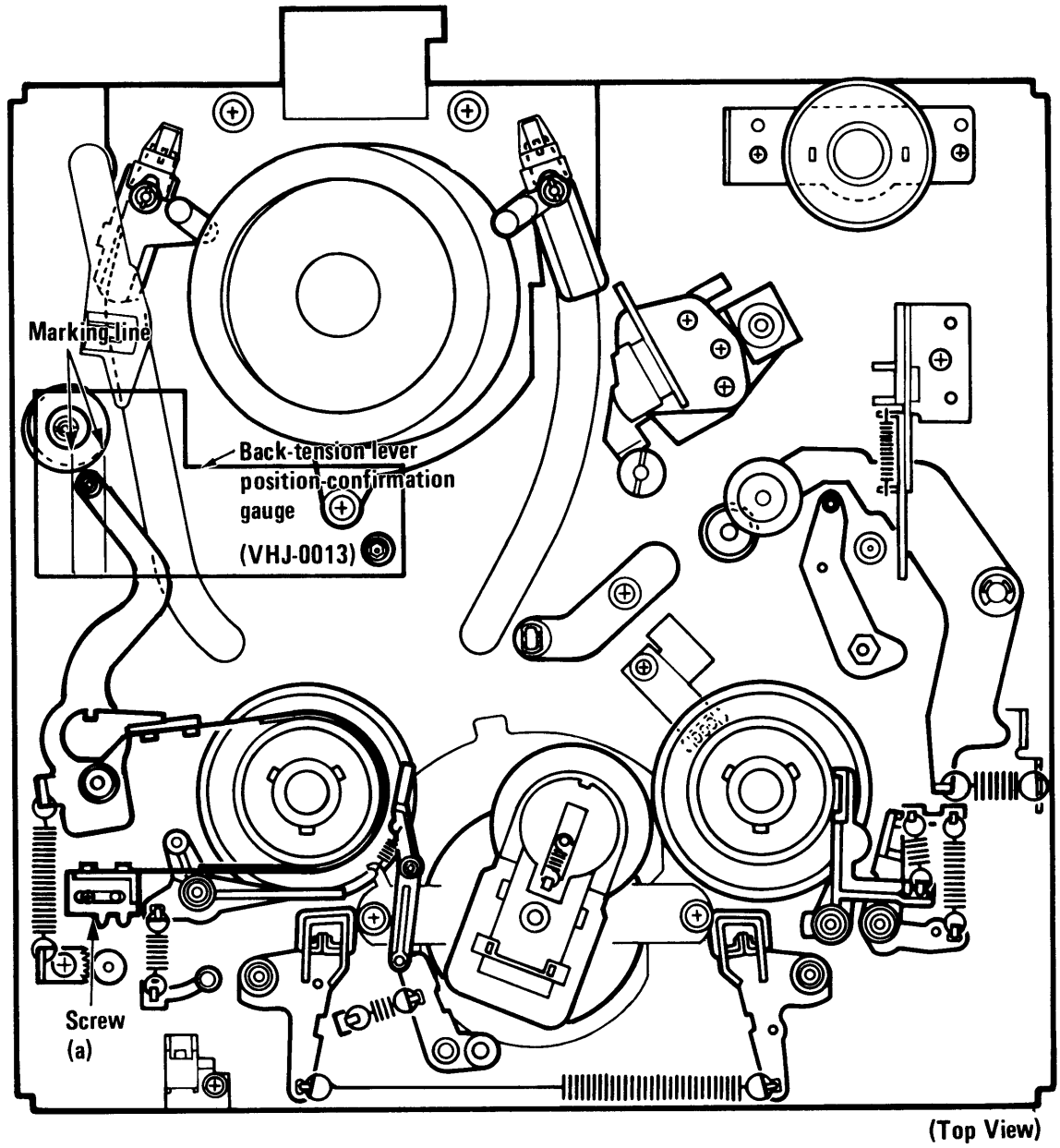


Fig. 2-6-2

2-6-3. BACK-TENSION TORQUE

(1) Load the cassette torque meter (VHJ-0016) and set to the PLAY mode.
(2) Check whether or not the back-tension torque value is wihin 45 ~ 70g-cm.
(3) If not, the bracket position should be adjusted.
  (A) Press the EJECT button and eject the cassette torque meter.
  (B) Remove the screw (a) and change the position of the bracket (b).
(4) Load the cassette torque meter once again and check the back-tension torque value.

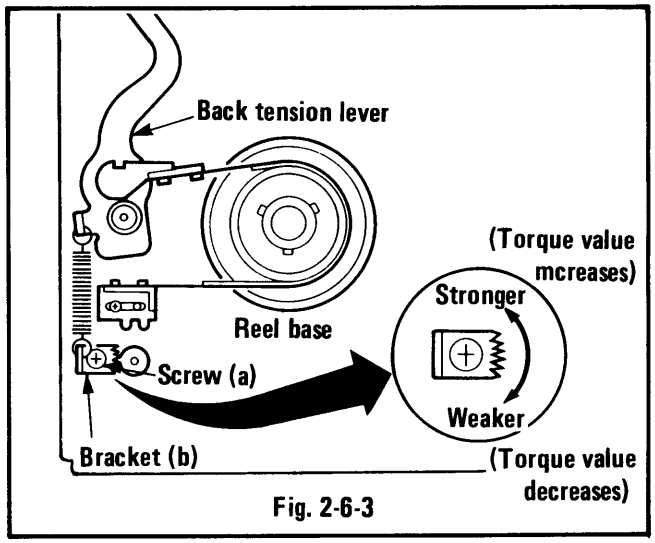


Fig. 2-6-3

2-6-4. TAPE SENSOR (TOP, END) POSITION ALIGNMENT (See Fig. 2-6-4.)

The installation position must be adjusted if the tape sensor is moved or is replaced.

(1) The unit should be in the STOP mode, with no tape cassette.

(2) Loosely tighten the tape sensor installation screw (a).

(3) Install jig no. VHJ-0024 as shown in the figure, and then adjust at the tape sensor circuit board so that the tape sensor LED is at the center of the gauge hole.

(4) After making the adjustment, firmly tighten the tape sensor installation screw (a).

(NOTE):

If the tape sensor position is deviated from the correct position, the unit might not operate (depending on the type of cassette tape). If this occurs, disconnect the power cord plug and then reconnect it.

Note that this jig (VHJ-0024) is also applicable for use with the VHR-1100, 1300 and 1500 series.

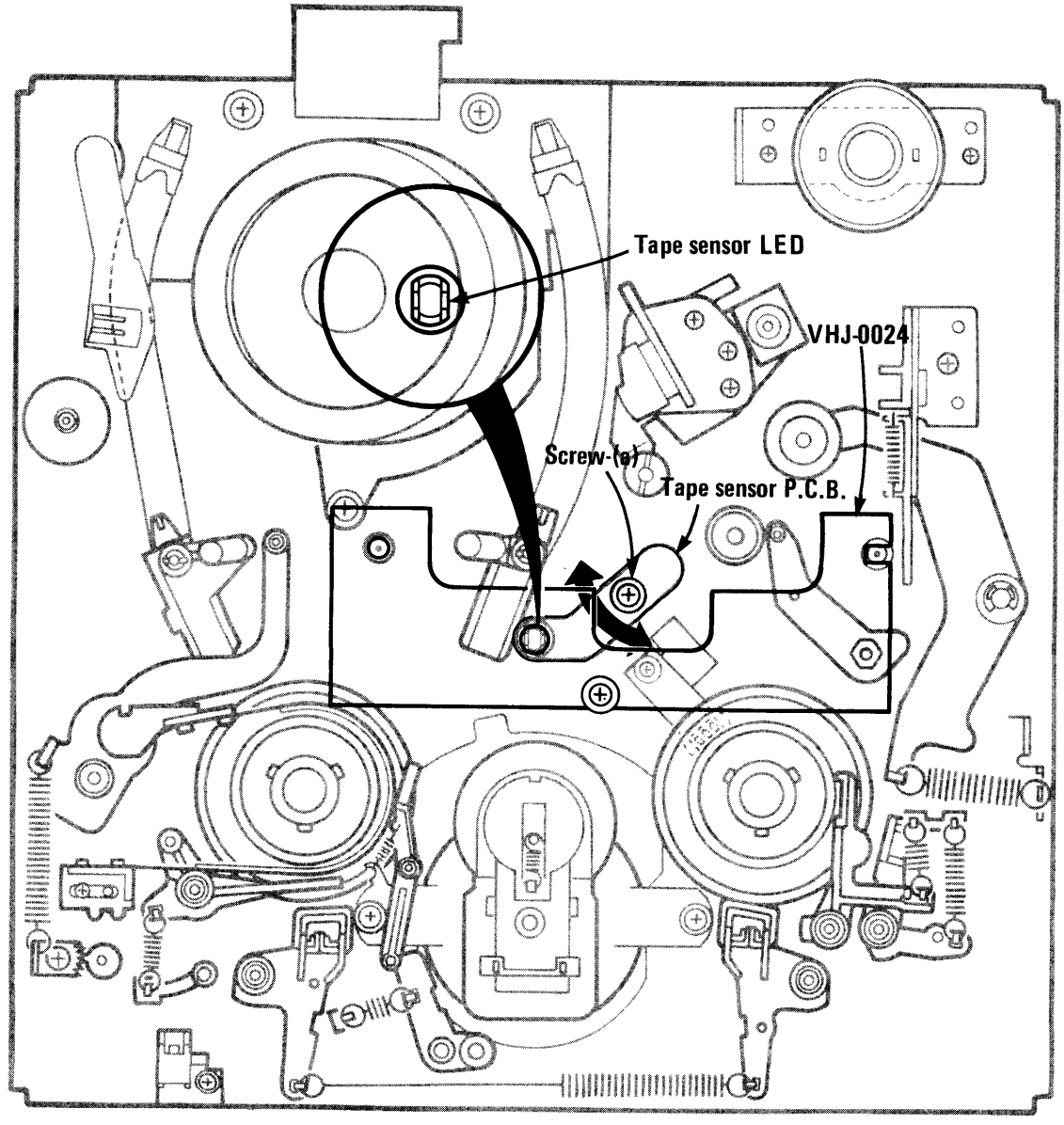


Fig. 2-6-4

2-6-5. GEAR POSITIONING (See Fig. 2-6-5.)

Gear positioning is necessary when a gear is removed and replaced.

(1) Turn the pulley completely clockwise (so that it is in the "unloading finished" condition).

(2) Check to be sure that the (A), (B) and (C) marks of each gear are aligned.

(3) If they are not aligned, remove the gear and then adjust so that the (A), (B) and (C) marks agree. (Do so in the (A), (B), (C) order.)

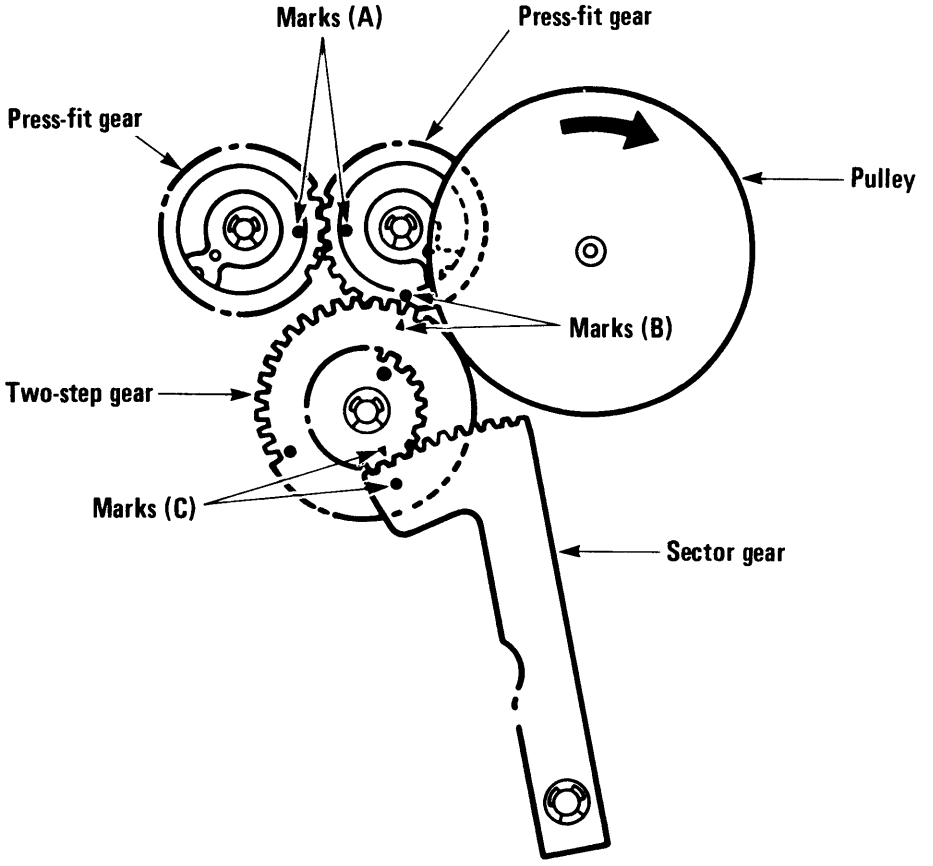


Fig. 2-6-5 (Bottom View)

2-6-6. MODE DETECTION SWITCH POSITIONING

(See Fig. 2-6-6.)

Mode switch positioning is necessary when the mode detection switch is removed and replaced.

(1) Turn the pulley completely clockwise, and then return it one turn counterclockwise.

(2) Check to be sure that the triangle mark on the mode detection switch and the triangle mark on the slide are aligned.

(3) If they are not aligned, loosen the two screws (a), move so that the triangle mark of the mode detection switch is aligned, and then tighten the screws (a).

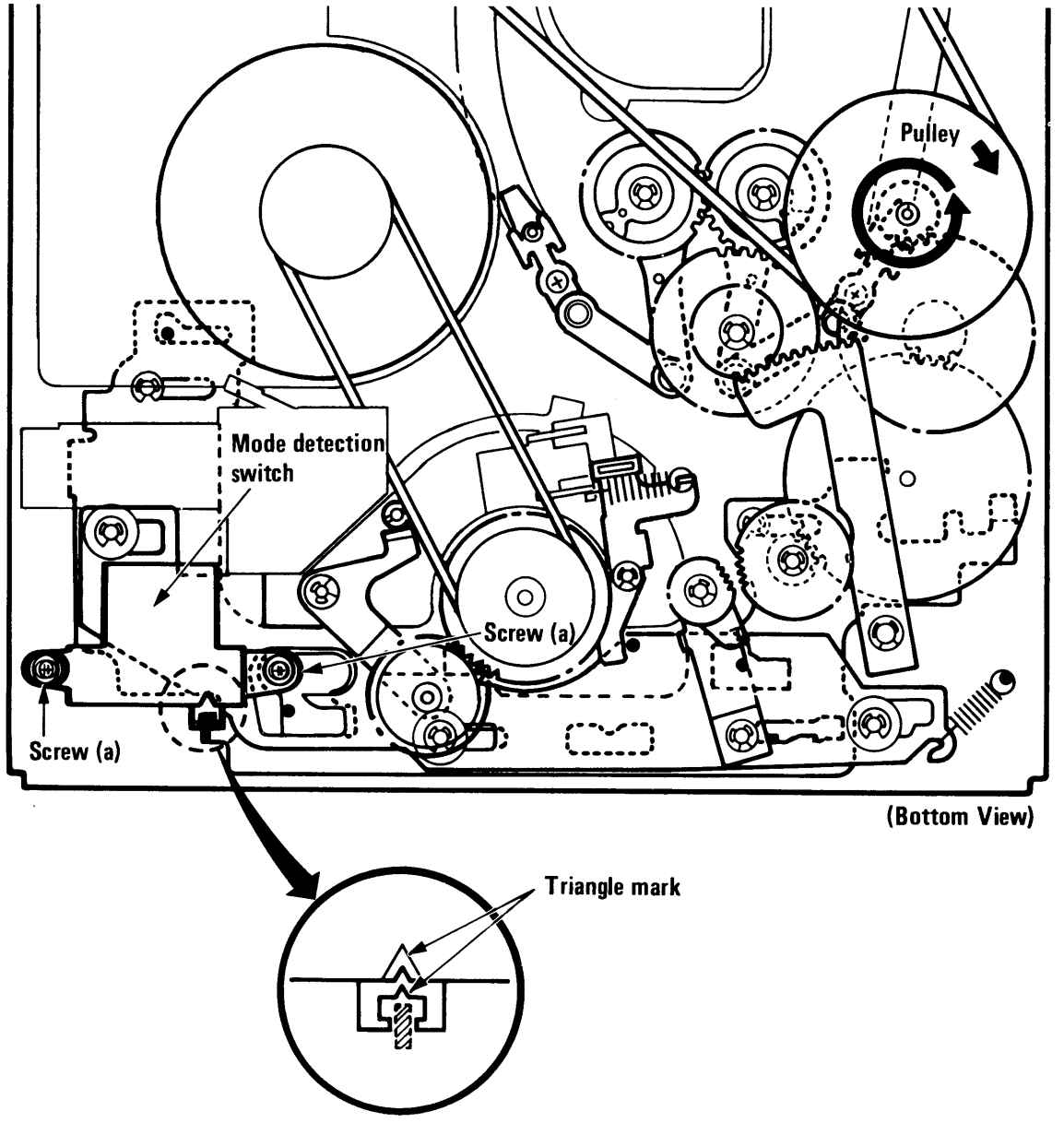


Fig. 2-6-6

2-6-7. ADJUSTMENT OF REVIEW GEAR BACKLASH (See Fig. 2-6-7.)

It there is excessive noise during REVIEW (R-SEARCH), or if the REVIEW gear is removed, adjustment of the backlash is necessary.

(1) Place the unit in the STOP mode.
(Check to be sure that review gear (a) and main slip gear (b) are meshed.)

(2) Adjust the order screw (c) so that there is a clearance of 31.1 ~ 31.2mm between the shafts of review gear (a) and main slip gear (b).

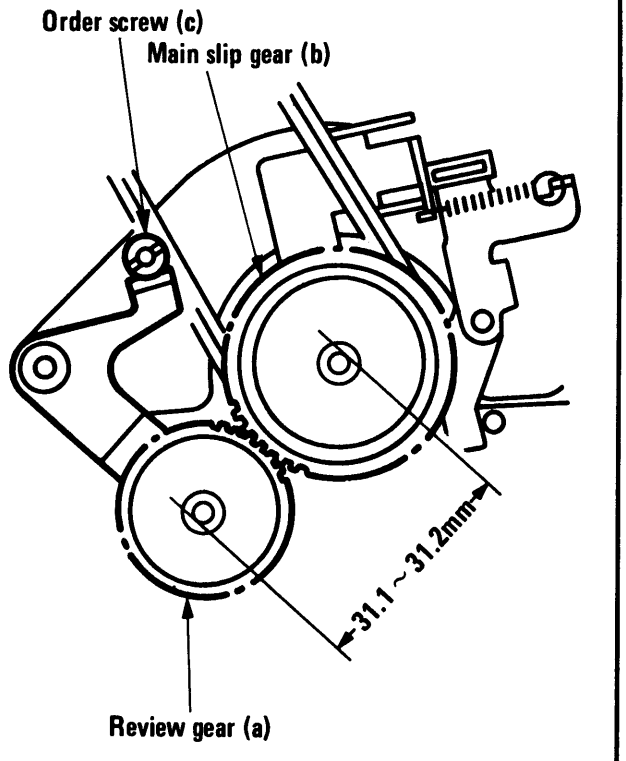


Fig. 2-6-7

2-6-8. CHECKING THE TORQUE (See Fig. 2-6-8.)

Using the torque meter (VHJ-0004), measure the torque in each mode.

Mode	Torque
PLAY	60 ~ 150g · cm
F-SEARCH	80 ~ 160g · cm
R-SEARCH	130 ~ 230g · cm
FWD/REW	400g · cm or more
UNLOADING	120 ~ 230g · cm

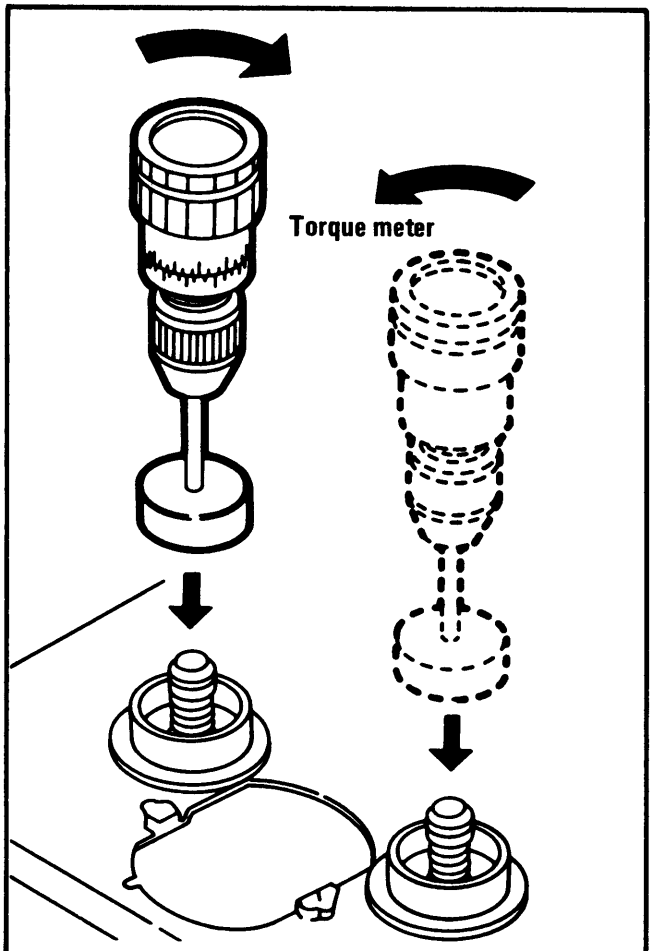


Fig. 2-6-8

(Note)

(1) The unloading take-up torque indicates the torque when unloading starts.

(2) For play, F-search and R-search, measure while turning the torque meter at a rate of about once in 3 seconds.
For FWD, REW and unloading, measure while the torque meter is in the locked-torque condition.

(3) When the reel base is locked, the system is disabled. To change to another mode, press the stop button to change to the reset mode.

2-7. CHECKING AND ADJUSTING THE TAPE-TRANSPORT SYSTEM (See Fig. 7-7-1.)

The tape-transport system has already been precisely adjusted by the manufacturer, and therefore no adjustment should normally become necessary.
Such checking and adjustment may however become necessary when, after long use, a component part of the tape-transport system is replaced, etc.

(1) Cleaning the tape-transport system

Tape residue, dust and dirt may accumulate in the tape-transport system after long use. Check the tape-transport system after cleaning the tape contact surfaces.

(2) Test points when adjusting tape transport

Make the tape transport adjustments while monitoring the envelope (RF output waveform) and the audio output waveform.

- When monitoring the envelope (RF output waveform), connect the oscilloscope to N1008 (on the VD-1 board) as follows:

Pin (1): envelope
Pin (2): ground
Pin (3); RF switching pulse (for trigger)

- When monitoring the audio output waveform, connect the oscilloscope to the audio output terminal on the VD-1 board (rear panel terminal).

(3) Checking the tape-transport system

Check the following points by using the two end parts of a T120 tape.

- Check to be sure that, during playback, the tape is not out of position upward or downward (from the lead) at the drum entrance and drum exit. If there is any positional deviation, adjust the height of the entrance and/or exit guide.
- Check to be sure that, during playback, there are no creases or wrinkles of the tape at the entrance guide, exit guide, etc. If there appears to be an irregular condition, adjust the height of the entrance guide, exit guide, etc.

Using the wound part of a T120 tape, record and playback in the EP mode and check the following points.

- Check to be sure that, during playback and reverse search, there are no creases or wrinkles at each guide. If there appears to be an irregular condition, make a minor adjustment of the height at the entrance guide, exit guide, etc.
- Check the start of the picture on the TV screen, and the audio, when there is mode switching such as from rewind to play, reverse search to play, etc. If there appears to be an irregular condition, adjust the tape-transport system.

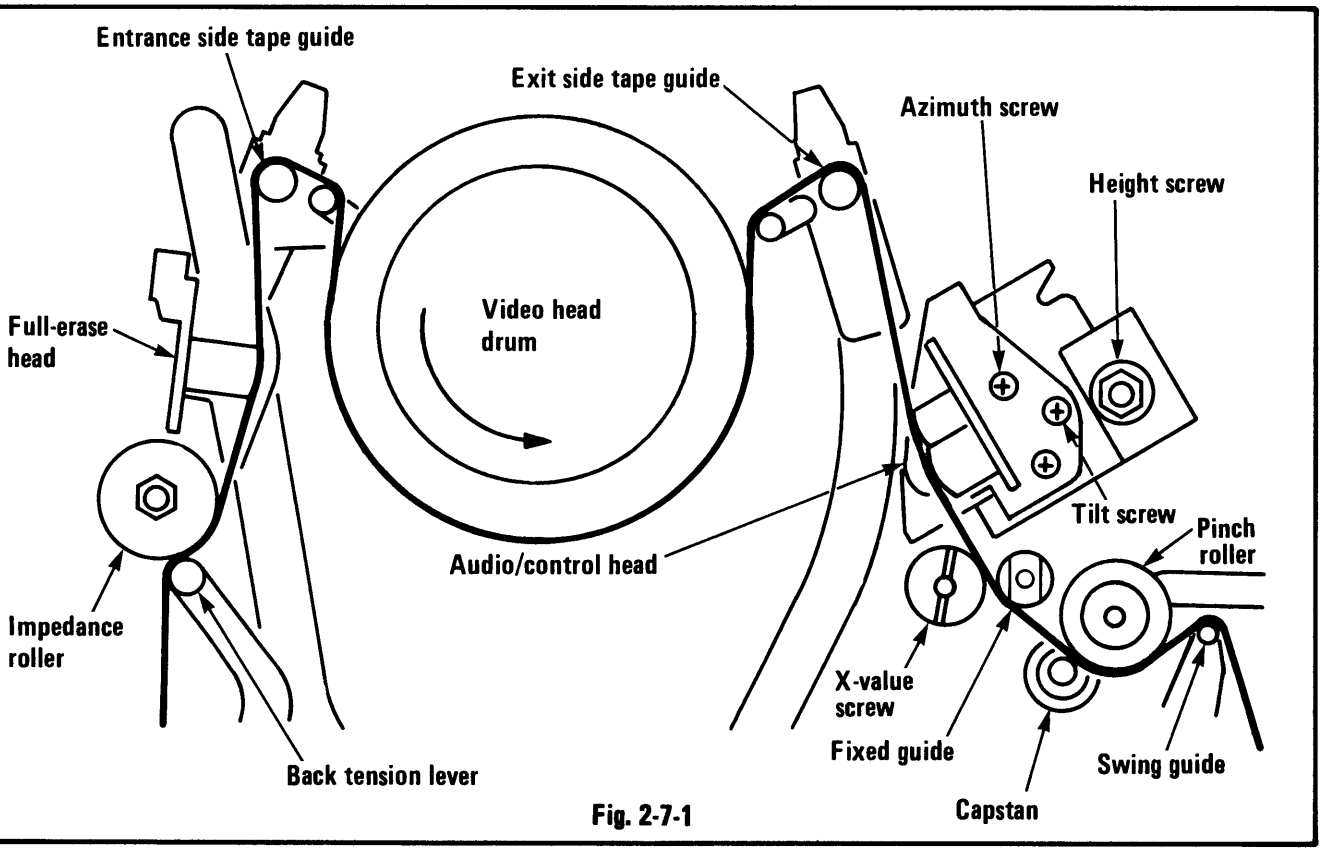
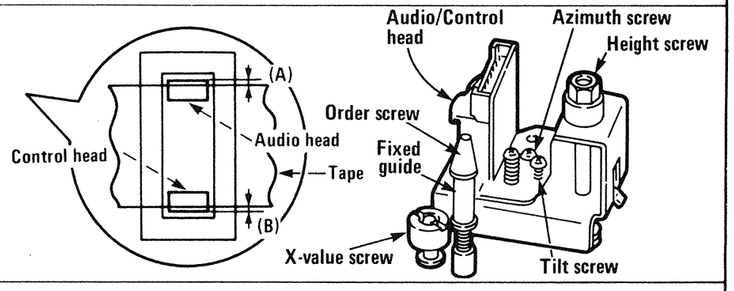


Fig. 2-7-1

2-8. TAPE-TRANSPORT ADJUSTMENT

	Adjustment Item	Adjustment Point	Tape	Adjustment method	Notes and check points
1	ENTRANCE SIDE, EXIT SIDE TAPE GUIDE	ENTRANCE SIDE, EXIT SIDE TAPE GUIDE	VHJ-0009	(1) Turn the tracking control to obtain the maximum envelope. (2) Tighten the entrance and exit guides after alternately loosening them, and adjust to the point where the envelope is flat.	(1) Monitor the envelope at the RF switching pulse LOW side, (Monitor at the – side of the oscilloscope trigger slope.) (2) Be careful not to tighten the entrance and exit guides excessively. (They should be tightened only to the extent that the front half and back half are not down.) (3) The height of the impedance roller is not to be adjusted. (Only if there is fluctuation of the envelope front half, then an adjustment can be made (within a range of 90°) in the direction in which the tape is lifted.
2	FIXED TAPE GUIDE	FIXED TAPE GUIDE	VHJ-0009	(1) Remove the order screw. (2) In the playback mode, free the guide and align the flange below the guide with the tape. (Adjust so that the tape is not pushed upward.)	(1) If the tape is creased at the lower flange during R-search, lower the fixed guide to the extent that there is no creasing. (2) Use the torque gauge driver (VHJ-0021) for installation of the order screw and tightening torque of it is 500 ±100g-cm.
3	AUDIO/CONTROL HEAD	AZIMUTH SCREW	VHJ-0009	(1) Adjust (by the azimuth screw) the audio level to maximum.	
		HEIGHT SCREW		(2) Visually adjust the head height. (Adjust so that the upper part(A) of the audio head and the lower part(B) of the control head can be seen equally.	
		TILT SCREW		(3) If the audio level fluctuates, tighten the tilt screw within a range of 90°, and again make the adjustments in items (1) and (2).	
		X-VALUE SCREW		(4) With the tracking control at the center position, and adjust so that the waveform (envelope) observed on the oscilloscope is maximized.	
4	RECORDING/ PLAYBACK CHECK	ENTRANCE SIDE, EXIT SIDE TAPE GUIDE	T120 TAPE (RECORDING/ PLAYBACK)	———	(1) Check the envelope (front half down 50% or less) during playback. (2) Check for tape creasing at each guide during playback and R-search. (Be careful of tape creasing at the fixed guide during R-search.)

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